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HILIGHT set on as ''
? b 155, 5, agri
       28oct02 16:09:33 User242957 Session D526.2
            $0.00    0.072 DialUnits File410
     $0.00  Estimated cost File410
     $0.65  TELNET
     $0.65  Estimated cost this search
     $0.65  Estimated total session cost   0.222 DialUnits

SYSTEM:OS  - DIALOG OneSearch
  File 155:MEDLINE(R)  1966-2002/Oct W3
*File 155: Alert feature enhanced for multiple files, duplicates
removal, customized scheduling. See HELP ALERT.
  File   5:Biosis Previews(R)  1969-2002/Oct W3
         (c) 2002 BIOSIS
*File   5: Alert feature enhanced for multiple files, duplicates
removal, customized scheduling. See HELP ALERT.
  File   6:NTIS  1964-2002/Oct W3
         (c) 2002 NTIS, Intl Cpyrght All Rights Res
*File   6: Alert feature enhanced for multiple files, duplicates
removal, customized scheduling. See HELP ALERT.
  File  10:AGRICOLA  70-2002/Oct
         (c) format only 2002 The Dialog Corporation
  File  34:SciSearch(R) Cited Ref Sci  1990-2002/Oct W4
         (c) 2002 Inst for Sci Info
*File  34: Alert feature enhanced for multiple files, duplicates
removal, customized scheduling. See HELP ALERT.
  File  50:CAB Abstracts  1972-2002/Sep
         (c) 2002 CAB International
*File  50: Truncating CC codes is recommended for full retrieval.
See Help News50 for details.
  File  65:Inside Conferences  1993-2002/Oct W4
         (c) 2002 BLDSC all rts. reserv.
  File  94:JICST-EPlus  1985-2002/Aug W4
         (c)2002 Japan Science and Tech Corp(JST)
  File  98:General Sci Abs/Full-Text  1984-2002/Sep
         (c) 2002 The HW Wilson Co.
  File  99:Wilson Appl. Sci & Tech Abs  1983-2002/Sep
         (c) 2002 The HW Wilson Co.
  File 143:Biol. & Agric. Index  1983-2002/Sep
         (c) 2002 The HW Wilson Co
  File 144:Pascal  1973-2002/Oct W4
         (c) 2002 INIST/CNRS
  File 203:AGRIS  1974-2002/May
        Dist by NAL, Intl Copr. All rights reserved
  File 235:AGROProjects  1990-  2002/Q6
         (c) 2002 PJB Publications,Ltd.
  File 266:FEDRIP  2002/Sep
        Comp & dist by NTIS, Intl Copyright All Rights Res
  File 306:Pesticide Fact File  1998/Jun
         (c) 1998 BCPC
*File 306: File has been updated & reloaded.  See HELP NEWS 306.  New
Bluesheet available in F415 & at URL http://library.dialog.com/bluesheets.
  File 357:Derwent Biotech Res.  _1982-2002/Oct W4
         (c) 2002 Thomson Derwent & ISI
*File 357: File updating has resumed.  See HELP NEWS 357.
Alert feature enhanced for multiple files, etc. See HELP ALERT.
  File 434:SciSearch(R) Cited Ref Sci  1974-1989/Dec
         (c) 1998 Inst for Sci Info

      Set  Items  Description
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? s ipt or (isopentenyl (w) transferase)
           2348  IPT
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            4779  ISOPENTENYL
          248595  TRANSFERASE
             444  ISOPENTENYL(W)TRANSFERASE
      S1    2519  IPT OR (ISOPENTENYL (W) TRANSFERASE)
? s s1 and and transform?
>>>Operator "AND" in invalid position
? s s1 and transform?
            2519  S1
         1660790  TRANSFORM?
      S2     659  S1 AND TRANSFORM?
? s s2 and express?
             659  S2
         3740671  EXPRESS?
      S3     394  S2 AND EXPRESS?
? s s3 and py<2000
Processing
>>>File 10 processing for PY=   : PY=2000
>>>    started at PY=A stopped at PY=196U
Processing
Processing
Processed  10 of  18 files ...
Processing
>>>One or more prefixes are unsupported
>>>  or undefined in one or more files.
Completed processing all files
             394  S3
        72505549  PY<2000
      S4     261  S3 AND PY<2000
? rd
>>>Duplicate detection is not supported for File 235.
>>>Duplicate detection is not supported for File 306.

>>>Records from unsupported files will be retained in the RD set.
...examined 50 records  (50)
...examined 50 records  (100)
...examined 50 records  (150)
...examined 50 records  (200)
...examined 50 records  (250)
...completed examining records
      S5     136  RD (unique items)
? t s5/3,ab/all
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 5/3,AB/1     (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

10415447   99403346   PMID: 10471937
  Inducible isopentenyl transferase as a high-efficiency marker
for plant transformation.
  Kunkel T; Niu Q W; Chan Y S; Chua N H
  Laboratory  of  Plant Molecular Biology, The Rockefeller University, 1230
York Ave., New York, NY 10021-6399,. USA.
  Nature biotechnology (UNITED STATES)   Sep 1999,  17  (9)  p916-9,
ISSN 1087-0156   Journal Code: 9604648
  Erratum in Nat Biotechnol 1999 Oct;17(10) 1025
  Document type: Journal Article
  Languages: ENGLISH
  Main Citation Owner: NLM
  Record type: Completed
  Overexpression  of  the  isopentenyltransferase gene (ipt) from the
Ti-plasmid of Agrobacterium tumefaciens increases cytokinin levels, leading
to  generation  of shoots from transformed plant cells. When combined
with  a  dexamethasone-inducible  system  for controlling expression,
ipt expression can be used to select for transgenic regenerants
```

without using an antibiotic-resistance marker. The combined system allows efficient cointroduction of multiple genes (in addition to **ipt**) and produces transgenic plants without morphological or developmental defects.

5/3,AB/2 (Item 2 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

09355833 97245302 PMID: 9090061
Effects of seed-specific **expression** of a cytokinin biosynthetic gene on canola and tobacco phenotypes.
Roeckel P; Oancia T; Drevet J
Laboratoire associe Universite Blaise Pascal, INRA, Organisation et Variabilite des Genomes Vegetaux, Clermont-Ferrand, France.
Transgenic research (ENGLAND) Mar **1997**, 6 (2) p133-41, ISSN 0962-8819 Journal Code: 9209120
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
The Agrobacterium tumefaciens **isopentenyl transferase** gene (**ipt**), a cytokinin biosynthetic gene, was placed under the control of 1.9 kb of promoter sequence from the 2S albumin AT2S1 gene isolated from an Arabidopsis thaliana library. The construct was introduced into canola (Brassica napus) and tobacco (Nicotiana tabacum). **ipt** transcripts were followed during embryo development of transgenic plants by northern hybridizations. The phenotype of **transformed** plants from the T1 generation was analysed and we observed an increased branching of inflorescences in tobacco and canola plants **expressing** the **ipt** gene. Comparing with controls, the average number of capsules and siliques in AT2S1-**ipt** plants was 82.6 and 24.8% higher, respectively. This result was correlated with an increase in cytokinin levels in transgenic plants, as revealed by RIA. Indeed, cytokinin contents of T1 AT2S1-**ipt** B. napus seeds were found 2.2-fold higher than cytokinin contents of control seeds, and T1 AT2S1-**ipt** N. tabacum capsules contained 2.6-fold more cytokinins than control capsules. In tobacco, the average seed weight per capsule was lower in AT2S1-**ipt** plants while the seed number per silique and the average seed weight were not modified in canola carrying this construct. The average seed yield per plant was not significantly increased in AT2S1-**ipt** tobacco or canola plants.

5/3,AB/3 (Item 3 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

08447934 95195152 PMID: 7888614
Light-induced **expression** of **ipt** from Agrobacterium tumefaciens results in cytokinin accumulation and osmotic stress symptoms in transgenic tobacco.
Thomas J C; Smigocki A C; Bohnert H J
Department of Biochemistry, University of Arizona, Tucson 85721.
Plant molecular biology (NETHERLANDS) Jan **1995**, 27 (2) p225-35 , ISSN 0167-4412 Journal Code: 9106343
Erratum in Plant Mol Biol 1995 Aug;28(5) 965
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
Cytokinins are plant growth regulators that induce shoot formation, inhibit senescence and root growth. Experiments with hydroponically grown tobacco plants, however, indicated that exogenously applied cytokinin led to the accumulation of proline and osmotin. These responses were also associated with environmental stress reactions, such as salt stress, in many plant species. To test whether increased endogenous cytokinin

accumulation led to NaCl stress symptoms, the gene **ipt** from Agrobacterium tumefaciens, encoding **isopentenyl transferase**, was **transformed** into Nicotiana tabacum cv. SR-1 under the control of the light-inducible rbcS-3A promoter from pea. In high light (300 mumol PPFD m-2 s-1), **ipt** mRNA was detected and zeatin/zeatin glucoside levels were 10-fold higher than in control plants or when **transformants** were grown in low light (30 mumol PPFD m-2 s-1). High light treatment was accompanied by increased levels of proline and osmotin when compared to low light grown **transformed** and untransformed control plants. Elevated in planta cytokinin levels induced responses also stimulated by salt stress, suggesting either common or overlapping signaling pathways are initiated independently by cytokinin and NaCl, setting in motion gene **expression** normally elicited by developmental processes such as flowering or environmental stress.

5/3,AB/4 (Item 4 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

08387135 95152559 PMID: 7849758
Promoter tagging with a promoterless **ipt** gene leads to cytokinin-induced phenotypic variability in transgenic tobacco plants:implications of gene dosage effects.
Hewelt A; Prinsen E; Schell J; Van Onckelen H; Schmulling T
Universitat Tubingen, Lehrstuhl fur Allgemeine Genetik, Germany.
Plant journal : for cell and molecular biology (ENGLAND) Dec **1994**, 6 (6) p879-91, ISSN 0960-7412 Journal Code: 9207397
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
Tobacco plants have been **transformed** with a T-DNA construct harboring a promoterless cytokinin-synthesizing **ipt** gene close to the right T-DNA border. Eighteen out of 85 transgenic clones displayed phenotypic alternations typical for an enhanced cytokinin production. Northern blot analysis confirmed the transcriptional activation of the introduced gene by tagged plant promoters. The concentration of cytokinins, **expressed** as zeatinriboside equivalents, was increased up to sevenfold in transgenic tissues. These increases in cytokinin levels resulted in major developmental changes. Transgenic clones exhibited to different levels traits of a general cytokinin-syndrome, i.e. reduced root growth, reduced apical dominance, reduced leaf surface, reduced growth of the stem and retarded leaf senescence or displayed localized and developmentally specific cytokinin-induced alterations in otherwise normally developing plants. These traits were in particular a simultaneous break of dormancy in all axillary buds before or at the onset of flowering or the reorientation of the developmental pathway of secondary meristems or terminally differentiated cells. This indicates that endogenously produced cytokinins not only influence different growth parameters but have the potential to alter differentiation pattern. The results show that stably inherited developmental alterations due to a general or localized cytokinin overproduction can be obtained by the promoter-tagging approach. The investigation of gene dosage effects in homozygote plants readdresses the question of threshold levels for cytokinin effects on the developmental program of plants.

5/3,AB/5 (Item 5 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

07053949 91363830 PMID: 1888890
Cytokinin content and tissue distribution in plants **transformed** by a reconstructed **isopentenyl transferase** gene.
Smigocki A C

Plant Molecular Biology Laboratory, U.S. Department of Agriculture, Beltsville, MD 20705.
Plant molecular biology (NETHERLANDS) Jan **1991**, 16 (1) p105-15
, ISSN 0167-4412 Journal Code: 9106343
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed

The cytokinin gene, **isopentenyl transferase** (**ipt**), was placed under the control of a heat-inducible promoter from the Drosophila melanogaster hsp70 gene and introduced into Nicotiana plumbaginifolia by cocultivation with Agrobacterium tumefaciens. **Transformants** were analyzed for organ-specific **expression**, cytokinin levels and effects on plant development before and after the heat induction. The **ipt** gene transcripts were detected in leaves and stems but not roots of transgenic plants following a 2 hour, 45 degrees C treatment. Maximum mRNA levels observed occurred 2 hours after heat treatment and 46 hours later were detected only in leaves. Zeatin and zeatinriboside concentrations 2 hours after heat shock ranged from over 900 to 2000 pmol/g, representing a greater than 140- to 200-fold increase over uninduced levels. After 46 hours, approximately 50% of the cytokinins are still present in the leaves as opposed to much reduced levels in the stems. Transgenic plants were greener, shorter, had an underdeveloped root system, reduced leaf width, and increased growth of axillary buds. After a single heat treatment, plants exhibited a darker green pigment and continued growth of lateral buds. Transient accumulations of endogenous cytokinins following thermal induction did not appear to alter the plant's preprogrammed pattern of differentiation.

5/3,AB/6 (Item 6 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

07022775 91355889 PMID: 2103461
Restoration of shooty morphology of a nontumorous mutant of Nicotiana glauca x N. langsdorffii by cytokinin and the isopentenyltransferase gene.
Feng X H; Dube S K; Bottino P J; Kung S D
Center for Agricultural Biotechnology, University of Maryland, College Park 20742.
Plant molecular biology (NETHERLANDS) Sep **1990**, 15 (3) p407-20
, ISSN 0167-4412 Journal Code: 9106343
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed

The shooty morphology of a nontumorous amphidiploid mutant of Nicotiana glauca Grah. x N. langsdorffii Weinm. was restored by cytokinins, whether exogenously applied or endogenously produced by **transformation** of the mutant with a transfer DNA (T-DNA) cytokinin-biosynthesis gene (isopentenyltransferase; **ipt**). Auxins alone did not confer this effect. Similar **transformation** was not achieved for the parental species. In the case of **transformation** with the **ipt** gene, selection of the **transformed** tissues was based on its hormone-independent growth in the presence of the antibiotic kanamycin. **Transformed** tissues exhibited a shooty morphology, indistinguishable from that of wildtype genetic tumors N. glauca x N. langsdorffii. This altered phenotype was caused by the presence and constitutive **expression** of the **ipt** gene. The insertion and **expression** of this gene in **transformed** tissues was confirmed by using the polymerase chain reaction (PCR) technique as well as conventional molecular hybridization analysis. **Expression** of the **ipt** gene led to an elevated level of cytokinin in the **transformed** mutant tissues. This evidence supports the notion that genetic tumors are caused, at least in part, by elevated levels of cytokinin in interspecific hybrids.

5/3,AB/7 (Item 7 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

06373585 90066436 PMID: 2479825
Extensive changes in DNA methylation patterns accompany activation of a silent T-DNA **ipt** gene in Agrobacterium tumefaciens-**transformed** plant cells.
John M C; Amasino R M
Department of Biochemistry, College of Agricultural and Life Sciences, University of Wisconsin-Madison 53706-0569.
Molecular and cellular biology (UNITED STATES) Oct **1989**, 9 (10) p4298-303, ISSN 0270-7306 Journal Code: 8109087
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
We crossed a male-sterile, Agrobacterium-**transformed** Nicotiana tabacum plant that contains a silent, hypermethylated T-DNA **ipt** oncogene with a normal tobacco plant and found that the methylated state of the **ipt** gene was stably inherited through meiosis in the offspring. However, when tissues of these plants were placed in cell culture, the **ipt** gene was spontaneously reactivated in a very small fraction of the cells; if 5-azacytidine was added to the culture medium, **ipt** gene reactivation occurred at high frequency. We analyzed the pattern of DNA methylation in a region spanning the **ipt** gene in a line that does not **express** the **ipt** gene, in five derivatives of this line that reexpressed the **ipt** gene either spontaneously or after 5-azacytidine treatment, and in tissues of a sibling of this line that reexpressed **ipt** spontaneously. We found that the **ipt** locus was highly methylated in the unexpressed state but that spontaneous or 5-azacytidine-induced reexpression always resulted in extensive demethylation of a region including 5' upstream, coding, and 3' downstream regions of the **ipt** gene. The role of DNA methylation in gene regulation in this system is discussed.

5/3,AB/8 (Item 8 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

06348440 90043783 PMID: 2811903
[Transfer of the agrobacterial gene for cytokinin biosynthesis into tobacco plants]
Perenos v rasteniia tabaka agrobakterial'nogo gena biosinteza tsitokinina.
Iusibov V M; Pogosian G P; Andrianov V M; Piruzian E S
Molekuliarnaia genetika, mikrobiologiia i virusologiia (USSR) Jul **1989**, (7) p11-3, ISSN 0208-0613 Journal Code: 9315607
Document type: Journal Article ; English Abstract
Languages: RUSSIAN
Main Citation Owner: NLM
Record type: Completed
The gene transfer into plants using the genetic engineering methods gives us the possibility to obtain transgeneric plants having acquired the new traits. Some bacterial genes can be used for this purpose. Obtaining of a transgeneric plant harbouring the cytokinin synthesis gene **ipt** (gene 4) from the T-DNA of Agrobacterium tumefaciens Ti-plasmid seems to be useful. The **expression** of tumor agrobacterial **ipt** gene in **transformed** plant cells interferes with the normal growth and regulation of the whole plant. The successful transfer of the cloned **ipt** gene from the recombinant plasmid pGV0319 into the tobacco plant using Agrobacterium vectors and succeeding regeneration of phenotypically normal transgenic plants are reported in the present paper.

5/3,AB/9 (Item 9 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

05923322 89026767 PMID: 3179274
Deoxyribonuclease I sensitivity of the T-DNA **ipt** gene is associated with gene **expression**.
Reid R A; John M C; Amasino R M
Department of Biochemistry, College of Agricultural and Life Sciences, University of Wisconsin, Madison 53706.
Biochemistry (UNITED STATES) Jul 26 **1988**, 27 (15) p5748-54,
ISSN 0006-2960 Journal Code: 0370623
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
We have analyzed the chromatin structure of the T-DNA **isopentenyl transferase** gene, **ipt** , in four Nicotiana tabacum crown gall tumor lines. These four **transformed** lines contain identical T-DNA inserts and are derivatives of a single clone that did not exhibit any tumorous properties and contained a highly methylated, nonexpressed copy of T-DNA. One of the derivatives also does not exhibit tumorous properties, and the T-DNA of this line is not **expressed**. The other three lines have reverted to tumorous growth either spontaneously or after treatment with the inhibitor of DNA methylation, 5-azacytidine. Concomitant with this reversion to tumorous growth, **expression** of the **ipt** gene of these lines has reinitiated. In the lines that **express** the **ipt** gene, the chromatin structure of this gene exists in a conformation that is more accessible to DNase I than in the line in which this gene is not **expressed**. The level of **ipt expression** and DNase I sensitivity was independent of the process by which the **transformed** cell lines reverted to tumorous growth. The relationship of chromatin structure to gene **expression** and DNA methylation in these lines is discussed.

5/3,AB/10 (Item 1 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

12160872 BIOSIS NO.: 199900455721
Photosynthesis of transgenic Pssu-**ipt** tobacco.
AUTHOR: Synkova Helena; Van Loven Karen; Pospisilova Jana; Valcke Roland(a)
AUTHOR ADDRESS: (a)Department SBG, Limburgs Universitair Centrum, Universitaire Campus, B-3590, Diepenbeek**Belgium
JOURNAL: Journal of Plant Physiology 155 (2):p173-182 Aug., **1999**
ISSN: 0176-1617
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English
SUMMARY LANGUAGE: English

ABSTRACT: The elevated content of endogenous cytokinin (CK), as the result of the introduction of the chimeric Pssu-**ipt** gene in tobacco, induced changes in growth, water regime and photosynthesis of transgenic grafts and rooted plants grown in a greenhouse. Despite closed stomata remarkable water stress was detected in Pssu-**ipt** plants. The ABA content was lower than in wild type tobacco, indicative of disturbances in ABA transport or metabolism. The rates of net photosynthesis (measured as CO2 uptake or O2 evolution) decreased by more than 50 % in Pssu-**ipt** grafts and by 20 % in Pssu-**ipt** rooted plants, respectively. The partial reactions of the electron transport chain in transgenic Pssu-**ipt** tobacco were differently influenced: the

activity of the reaction centre of PSII was hardly affected; the PSI activity and the intersystem electron transport chain was inhibited up to 70 %, particularly in the Pssu-**ipt** grafts. Although the slight decrease in the potential photochemical efficiency of PSII, **expressed** as Fv/Fm, was found in transgenic plants, the actual quantum yields, photochemical efficiencies, and qp under steady-state conditions indicated that transgenic plants were not seriously limited by the redox state of QA. The reaction centre of PSII was well preserved. In transgenic grafts, photophosphorylation capacity was strongly reduced, which could correspond with lower non-photochemical quenching. The above mentioned changes are the results of elevated CK content per se rather than the effect of altered water relations in the plants, caused by the disproportion of shoots and root system in both Pssu-**ipt** grafts and plants.

1999

5/3,AB/11 (Item 2 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

11827888 BIOSIS NO.: 199900073997
Autonomy to plant growth regulators and gene **expression** in periwinkle cultures in vitro.
AUTHOR: Droual Anne-Marie(a); Hamdi Said(a); Creche Joel(a); Kevers Claire; Rideau Marc(a)
AUTHOR ADDRESS: (a)Lab. Biol. Mol. Biochim. Vegetale, EA 2106, Fac. Pharm., 31 Ave. Monge, F-37200 Tours-Cedex**France
JOURNAL: Journal of Plant Physiology 153 (5-6):p623-630 Nov., **1998**
ISSN: 0176-1617
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: To better understand the effect of habituation on gene **expression** in plant cells, we have compared the accumulation of specific mRNAs encoding respectively two proline-rich proteins, a chaperone protein and three enzymes linking primary and secondary metabolisms in two models of in vitro culture of periwinkle. These models consisted of two couples of a 2,4-dichlorophenoxyacetic acid-dependent/2,4-dichlorophenoxyacetic acid independent line in which autonomy to auxin and cytokinin was obtained either through habituation or through **transformation** with the isopentenyltransferase gene from Agrobacterium tumefaciens. Results showed that gene **expression** was modified by plant growth regulator autonomy but differently according to the type of autonomy: only the gene encoding a hydroxyproline-rich glycoprotein was regulated similarly in both PGR-independent lines. On the other hand, PGR autonomy did not lead to total insensitivity to exogenously-applied PGRs, and the two PGR autonomous lines did not accumulate indole alkaloids for different reasons.

1998

5/3,AB/12 (Item 3 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

11666966 BIOSIS NO.: 199800448697
Expression of the bacterial **ipt** gene in Physcomitrella rescues mutations in budding and in plastid division.
AUTHOR: Reutter Kirsten; Atzorn Rainer; Hadeler Birgit; Schmuelling Thomas; Reski Ralf(a)

AUTHOR ADDRESS: (a)Albert-Ludwigs-Universitaet, Institut fuer Biologie II, Schaenzlestr. 1, D-79104 Freiburg**Germany
JOURNAL: Planta (Berlin) 206 (2):p196-203 Oct. 1998
ISSN: 0032-0935
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Development of Physcomitrella patens (Hedw.) B.S.G. starts with a filamentous protonema growing by apical cell division. As a developmental switch, some subapical cells produce three-faced apical cells, the so-called buds, which grow to form leafy shoots, the gametophores. Application of cytokinins enhances bud formation but no subsequent gametophore development in several mosses. We used the **ipt** gene of Agrobacterium tumefaciens, encoding a protein which catalyzes the rate-limiting step in cytokinin biosynthesis, to **transform** two developmental Physcomitrella mutants. One mutant (P24) was defective in budding (bud) and thus did not produce three-faced cells, while the other one (PC22) was a double mutant, defective in plastid division (pdi), thus possessing at the most one giant chloroplast per cell, and in gametophore development (gad), resulting in malformed buds which could not differentiate into leafy gametophores. **Expression** of the **ipt** gene rescued the mutations in budding and in plastid division but not the one in gametophore development. By mutant rescue we provide evidence for a distinct physiological difference between externally applied and internally produced cytokinins. Levels of immunoreactive cytokinins and indole-3-acetic acid were determined in tissues and in culture media of the wild-type moss, both mutants and four of their stable **ipt** **transformants**. Isopentenyl-type cytokinins were the most abundant cytokinins in Physcomitrella, whereas zeatin-type cytokinins, the major native cytokinins of higher plants, were not detectable. Cytokinin as well as auxin levels were enhanced in **ipt** transgenics, demonstrating a cross-talk between both metabolic pathways. In all genotypes, most of the cytokinin and auxin was found extracellularly. These extracellular pools may be involved in hormone transport in the non-vascular mosses. We suggest that both mutants are defective in signal-transduction rather than in cytokinin metabolism.
1998

5/3,AB/13 (Item 4 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

11622744 BIOSIS NO.: 199800404879
The cloning of rolC gene and over **expression** of cytokinins in Nicotiana tabacum.
AUTHOR: Jia Yan-Tao; Ma Mi(a); Qu Gui-Ping; Qian Zhong-Xing; Lin Zhong-Ping
AUTHOR ADDRESS: (a)Inst. Bot., Chinese Acad. Sci., Beijing 100093**China
JOURNAL: Acta Botanica Sinica 40 (3):p211-215 March, **1998**
ISSN: 0577-7496
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: Chinese; Non-English
SUMMARY LANGUAGE: Chinese; English

ABSTRACT: Using PCR method the rolC gene was amplified from Agrobacterium rhizogenes, and CaMV 35S/rolC **expression** vector pCaR was constructed. The chimeric gene via agrobacterium mediated procedure was **transformed** separately into the wild type tobacco (Nicotiana tabacum L. cv. W38) and the transgenic tobacco of **ipt** gene. The putative transgenic plants were assayed with Southern blot and RNA Dot blot analysis. The observation suggested that the transgenic tobacco exhibited the abnormal phenotypes as a consequence of the overproduction

of cytokinins. Whereas the ELISA assay indicated that the cytokinins level increased separately in transgenic plants. The growth of the transgenic plants show multiple budding of shoots with short internodal length.

1998

5/3,AB/14 (Item 5 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

11610186 BIOSIS NO.: 199800391950
Phenotypes of tobacco plants **expressing** genes for the synthesis of growth regulators.
AUTHOR: Hlinkova E(a); Obert B; Filipp D(a)
AUTHOR ADDRESS: (a)Dep. Genet., Fac. Nat. Sci., Comenius Univ., 84215 Bratislava**Slovakia
JOURNAL: Biologia Plantarum (Prague) 41 (1):p25-37 **1998**
ISSN: 0006-3134
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The **expression** of genes for synthesis of auxin (iaaM and iaaH) and cytokinins (**ipt**) was studied in tobacco plants **transformed** by two Agrobacterium tumefaciens strains C 58 and LBA 4404. The strain LBA 4404 carried binary vector plasmid pCB 1334 (**ipt** gene) and plasmid pCB 1349 (iaaM, iaaH and ila genes). Both plasmids carried reported gene for npt II. Obtained plants **expressed** incorporated genes. New proteins with molecular masses of about 74, 40, 26, 25, 21 and 17 kDa for wild plasmid pTi C58; 60, 36, 31.5, 27, 26 and 17 kDa for binary vector plasmid pCB 1334 and 74, 49, 36, 31.5, 26 and 25 kDa for binary vector plasmid pCB 1349 were found in the patterns of soluble proteins. Significant changes in the content of chlorophylls, especially chlorophyll a, were detected in the plants carrying **ipt** gene and in plants **transformed** by the wild strain C58 of A. tumefaciens. Tobacco plants **expressing ipt** gene and genes from T-DNA of pTi C58 plasmid were dwarf, and in comparison to the controls, they had thicker stems, and the surface of the leaf blades was reduced to 20-50%. Adventitious roots, growing from the stem, were typical for **transformants** overproducing auxins. Regenerants and **transformants expressing** genes from T-DNA of plasmid pTi C58 differed in the shape of the flowers and their fertility.

1998

5/3,AB/15 (Item 6 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

11436866 BIOSIS NO.: 199800218198
Controlled cytokinin production in transgenic tobacco using a copper-inducible promoter.
AUTHOR: McKenzie Marian Jane(a); Mett Vadim; Reynolds Paul Hugh Stewart; Jameson Paula Elizabeth
AUTHOR ADDRESS: (a)Dep. Plant Biol. Biotechnol., Massey Univ., Private Bag 11222, Palmerston North**New Zealand
JOURNAL: Plant Physiology (Rockville) 116 (3):p969-977 March, **1998**
ISSN: 0032-0889
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The cytokinin group of plant hormones regulates aspects of plant growth and development, including the release of lateral buds from apical dominance and the delay of senescence. In this work the native promoter of a cytokinin synthase gene (**ipt**) was removed and replaced with a Cu-controllable promoter. Tobacco (Nicotiana tabacum L. cv tabacum) **transformed** with this Cu-inducible **ipt** gene (Cu-**ipt**) was morphologically identical to controls under noninductive conditions in almost all lines produced. However, three lines grew in an altered state, which is indicative of cytokinin overproduction and was confirmed by a full cytokinin analysis of one of these lines. The in vitro treatment of morphologically normal Cu-**ipt transformants** with Cu2+ resulted in delayed leaf senescence and an increase in cytokinin concentration in the one line analyzed. In vivo, inductive conditions resulted in a significant release of lateral buds from apical dominance. The morphological changes seen during these experiments may reflect the spatial aspect of control exerted by this gene **expression** system, namely **expression** from the root tissue only. These results confirmed that endogenous cytokinin concentrations in tobacco **transformants** can be temporally and spatially controlled by the induction of **ipt** gene **expression** through the Cu-controllable gene-**expression** system.

1998

5/3,AB/16 (Item 7 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

11271836 BIOSIS NO.: 199800053168
Studies of cytokinin action and metabolism using tobacco plants **expressing** either the **ipt** or the GUS gene controlled by a chalcone synthase promoter. II. **ipt** and GUS gene **expression**, cytokinin levels and metabolism.
AUTHOR: Wang Jian; Letham D S(a); Cornish Edwina; Wei K; Hocart C H; Michael M; Stevenson K R
AUTHOR ADDRESS: (a)Cooperative Res. Centre Plant Sci., Res. Sch. Biological Sci., Australian Natl. Univ., GPO Box 4**Australia
JOURNAL: Australian Journal of Plant Physiology 24 (5):p673-683 **1997**
ISSN: 0310-7841
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The **expression** of GUS and **ipt** genes under control of a chalcone synthase (chs) promoter (PCHS) has been determined in tobacco (Nicotiana tabacum L.) plants and related to the development of plants **expressing** the chimaeric PCHS-**ipt** gene. GUS gene **expression**, which served as a model for the **expression** of the **ipt** gene, was highest in the internal phloem tissue of stems, in mature leaf laminae and in the upper part of corollas when fully open. **Expression** of the PCHS-**ipt** gene was assessed by quantifying the cytokinins produced, by determining incorporation of (3H)adenine into cytokinins and by quantifying **ipt** mRNA. Results from these studies were in general agreement with those based on **expression** of the PCHS-GUS gene. The chs promoter controlled **expression** of the **ipt** gene with some degree of tissue and temporal specificity. **Expression** of the **ipt** gene markedly elevated the cytokinin level in mature leaf laminae and the upper stems of flowering plants. The former was associated with retardation of leaf senescence and increased rates of transpiration due to changes in number, size and aperture of stomata, while the latter was associated with development of lateral shoots. In shoot tip cultures, 2-fold elevations in endogenous cytokinin

level caused clear changes in development and this is discussed in relation to current concepts concerning the hormonal control of plant development. Using the transgenic tobacco tissues, it was shown that cis-zeatin is a substrate for cytokinin oxidase, that cis-zeatin is not converted to trans-zeatin in these tissues and that the endogenous cytokinin level influences the level of cytokinin oxidase activity in tissue and the rate of degradation of exogenous zeatin riboside to adenosine.
1997

5/3,AB/17 (Item 8 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

11271835 BIOSIS NO.: 199800053167
Studies of cytokinin action and metabolism using tobacco plants **expressing** either the **ipt** or the GUS gene controlled by a chalcone synthase promoter. I. Developmental features of the transgenic plants.
AUTHOR: Wang Jian; Letham D S(a); Cornish Edwina; Stevenson K R
AUTHOR ADDRESS: (a)Cooperative Res. Centre Plant Sci., Res. Sch. Biological Sci., Australian Natl. Univ., GPO Box 4**Australia
JOURNAL: Australian Journal of Plant Physiology 24 (5):p661-672 **1997**
ISSN: 0310-7841
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: A chimaeric cytokinin biosynthetic gene was constructed by placing the coding region of the bacterial **ipt** gene under the control of a chalcone synthase (chs) promoter (PCHS) from Antirrhinum majus. The PCHS-**ipt** gene was transferred to tobacco (Nicotiana tabacum L.). To provide control plants for studies of the effect of **expression** of this gene on plant development, a PCHS beta-glucuronidase gene fusion was also introduced into tobacco. **Expression** of the PCHS-**ipt** gene caused release of axillary buds, inhibition of root development, retardation of leaf senescence, elevation of chlorophyll levels, delay in onset of flowering and retardation of flower development. These effects, which were quantified in PCHS-**ipt** plants, have previously been associated with **expression** of **ipt** genes controlled by heat shock or other promoters. Additional effects of **ipt** gene **expression** characterized in PCHS-**ipt** plants included growth of leafy shoots from the primary root, change in leaf shape with the production of broader and larger leaves, induction of expansion of excised leaf discs and development of leaves with an enlarged midrib and enlarged veins. A particularly striking effect of the **expression** of the PCHS-**ipt** gene was development of thicker stems due mainly to increase of pith tissue caused by an enhancement of both cell division and cell enlargement. Node number per primary stem was also increased. Endogenous cytokinin and applied auxin interacted antagonistically to affect both root and stem development in plants cultured in vitro. The leaves of PCHS-**ipt transformed** plants exhibited increased transpiration rates and reduced diffusion resistance associated with increased number of stomata and modified stomatal dimensions. The above changes, which were associated with elevated endogenous cytokinin levels, are discussed in relation to previous studies with **ipt** gene **transformed** plants and to some aspects of normal plant development.

1997

5/3,AB/18 (Item 9 from file: 5)

DIALOG(R)File 5:Biosis Previews(R)

10897302 BIOSIS NO.: 199799518447
The role of cytokinin biosynthetic gene in regulating the **expression** of a class of pathogenesis-related protein genes in tobacco plants.
AUTHOR: Ma Qing-Hu Song Yan-Ru; Sun Jing-San
AUTHOR ADDRESS: Inst. Bot., Acad. Sinica, Beijing 100093**China
JOURNAL: Acta Botanica Sinica 38 (11):p870-874 **1996**
ISSN: 0577-7496
RECORD TYPE: Abstract
LANGUAGE: English
SUMMARY LANGUAGE: English; Chinese

ABSTRACT: The **expression** characteristics of a class of pathogenesis-related protein (PR) genes, namely basic chitinase, beta-1, 3-glucanase, osmotin and extensin. were studied in tobacco (Nicotiana tabacum cv. Wisconsin 38) plants. RNA blot hybridization showed that these four genes were regulated in a developmental and organ-specific manner in tobacco. In the transgenic fascicular shoots which contained the active cytokinin biosynthetic gene (**ipt** gene) from Agrobacterium tumefaciens, the **expressions** of these four genes were co-regulated by overproduction of endogenous cytokinins and vector effect. Cytokinins reduced the **expressions** while vector effect induced the **expressions** of these four genes. Heat shock also decreased the steady-state levels of the four RNAs. These data suggest a complex regulation of PR genes.

1996

5/3,AB/19 (Item 10 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

10887646 BIOSIS NO.: 199799508791
Auxin-cytokinin interactions in wild-type and transgenic tobacco.
AUTHOR: Eklof Staffan(a); Astot Crister(a); Blackwell John(a); Moritz Thomas(a); Olsson Olof; Sandberg Goran(a)
AUTHOR ADDRESS: (a)Dep. Forest Genetics and Plant Physiol., Swed. Univ. Agric. Sci., S-901 83 Umea**Sweden
JOURNAL: Plant and Cell Physiology 38 (3):p225-235 **1997**
ISSN: 0032-0781
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Cytokinins and auxins are important regulators of plant growth and development, but there is incomplete and conflicting evidence that auxins affect cytokinin metabolism and vice versa. We have investigated these interactions in Nicotiana tabacum L. by separate in planta manipulation of levels of the hormones followed by analysis of the induced changes in the metabolism of the other hormone. Cytokinin-overproducing plants (**expressing** the Agrobacterium tumefaciens **ipt** gene) had lower than wild-type levels of free IAA, and reduced rates of IAA synthesis and turnover, but there were no differences in the profiles of metabolites they produced from fed IAA. Similarly, auxin-overproducing plants (**expressing** the A. tumefaciens iaaM and iaaH genes), had lower levels of the major cytokinins than wild-type plants and lower cytokinin oxidase activity, but there were no differences in the profiles of metabolites they produced from fed cytokinins. The data demonstrate that cytokinin or auxin overproduction decreases the content of the other hormone, apparently by decreasing its rate of synthesis and/or transport, rather than by increasing rates of turnover or conjugation. Implications for the

importance of cytokinin:auxin ratios in plant development are considered.

1997

5/3,AB/20 (Item 11 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

10788777 BIOSIS NO.: 199799409922
Regulation of cytokinin oxidase activity in tobacco callus **expressing** the T-DNA **ipt** gene.
AUTHOR: Redig Pascale; Motyka Vaclav; Van Onckelen Henri A; Kaminek Miroslav(a)
AUTHOR ADDRESS: (a)De Montfort Univ. Norman Borlaug Centre Plant Sci., Inst. Exp. Bot., Acad. Sci. Czech Republic, **Czech Republic
JOURNAL: Physiologia Plantarum 99 (1):p89-96 **1997**
ISSN: 0031-9317
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: There are indications that the cytokinin content in transgenic tissues **expressing** the cytokinin biosynthetic **ipt** gene is under metabolic control, which prevents the accumulation of cytokinins to lethal levels. The objective of this study was to investigate the relationships between the content of endogenous cytokinins and the activity of cytokinin oxidase (which is believed to be a copper-containing amine oxidase, EC 1.4.3.6.) in **ipt** transgenic tobacco callus. In addition, the effect of exogenously applied N-6-benzyladenine (BA) on this relationship was examined. Endogenous cytokinin concentrations were measured in callus of Nicotiana tabacum L. cv. Petit Havana SR1 **transformed** with the **ipt** of Agrobacterium tumefaciens under the control of a light-inducible promoter and in non-**transformed** tissue using LC-tandem mass spectrometry. The activity of cytokinin oxidase was estimated by measuring the conversion of (2,8-3H)N-6-(DELTA-2-isopentenyl)adenine to (3H)adenine by enzyme preparations in vitro. The 14-day-old **ipt-transformed** callus contained a 25-fold higher amount of cytokinins as compared to the non-**transformed** tissue. Mainly zeatin- and dihydrozeatin types of cytokinins (free bases, ribosides, nucleotides and O-glucosides) accumulated in the **ipt** transgenic tissue. The cytokinin pool of both **ipt-transformed** and non-**transformed** tissues consisted predominantly of cytokinins that are either resistant to cytokinin oxidase attack (nucleotides and O-glucosides of cytokinins and cytokinins bearing N-6-saturated side chain) or have a low affinity for the enzyme (zeatin and its riboside). The former represented 71.6 and 74.8% and the latter 27.7 and 24.4% of the pool of endogenous cytokinins in **ipt-transformed** and non-**transformed** tissues, respectively. Enzyme preparations from **ipt-transformed** tissue exhibited 1.5-fold higher cytokinin oxidase activity compared with that observed in control tissues. Application of exogenous BA affected the total levels of cytokinins of the two tissue fines in different ways. The cytokinin content increased by 1.7- and 1.5-fold in **ipt-transformed** tissues 6 and 12 h after BA application, respectively, while it declined in the non-**transformed** control by 1.6- to 2.0-fold between 3 and 12 h after BA application. The increase in cytokinin content in the **ipt** callus is due to an increase of zeatin- and dihydrozeatin-type cytokinins (nucleotides, ribosides and free bases) leading to an enhanced accumulation of O-glucosides after 12 h. Following BA treatment, the cytokinin oxidase activity increased up to 1.8-fold in **ipt-transformed** and 1.6-fold in nontransformed tissues. The levels of isopentenyl-type cytokinins were near the detection limit; however, the enhancement of cytokinin oxidase activity after BA treatment in both tissue lines was correlated with the content

of preferred substrate of the enzyme, N-6-(DELTA-2-isopentenyl)adenosine.

1997

5/3,AB/21 (Item 12 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

10639343 BIOSIS NO.: 199699260488
Cytokinin metabolites and gradients in wild type and transgenic tobacco with moderate cytokinin over-production.
AUTHOR: Ekloff Staffan; Astot Crister; Moritz Thomas; Blackwell John; Olsson Olof; Sandberg Goran(a)
AUTHOR ADDRESS: (a)Dep. Forest Genetics Plant Physiol., Swed. Univ. Agric. Sch., S-901 85 Umea**Switzerland
JOURNAL: Physiologia Plantarum 98 (2):p333-344 **1996**
ISSN: 0031-9317
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: A binary T-DNA plant **expression** vector carrying a promoterless **isopentenyl transferase** (**ipt**) gene was constructed and used to **transform** Nicotiana tabacum L. Several primary **transformants** were obtained that displayed a range of phenotypes characteristic of cytokinin over-production. Two of the **transformants** with moderately altered phenotypes, both of which produced viable offspring and **expressed** the **ipt** gene at a low level, were selected for use in studies of the regulation of cytokinin metabolism. Both lines were found to contain high concentrations of zeatin-7-glucoside (Z7G), indicating that Z7G can accumulate in plants even when the rate of endogenous overproduction of cytokinins is low. This supports the hypothesis that 7-glucosidation is an important step in the regulation of zeatin (Z) levels. Very sharp gradients in concentration of cytokinin riboside and ribotides, related to age of tissue and distance from the apex, were found in both wild type and **transformed** plants, which could be important in developmental regulation and could also account for some of the discrepancies between reported cytokinin levels in various plants. Intriguingly, however, although the combined level of zeatin riboside and ribotide was much higher in the **transformed** plants than in wild type, the combined level of isopentenyl riboside and ribotide was lower.

1996

5/3,AB/22 (Item 13 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

10616456 BIOSIS NO.: 199699237601
Analysis of cytokinin metabolism in **ipt** transgenic tobacco by liquid chromatography-tandem mass spectrometry.
AUTHOR: Redig Pascale(a); Schmuelling Thomas; Van Onckelen Harry
AUTHOR ADDRESS: (a)Univ. Antwerp, Dep. Biol., Universiteitsplein 1, B-2610 Antwerpen, Belgium**Germany
JOURNAL: Plant Physiology (Rockville) 112 (1):p141-148 **1996**
ISSN: 0032-0889
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The endogenous levels of the major, naturally occurring

cytokinins in Pisum sativum ribulose-1,5-bisphosphate carboxylase small subunit promoter-**isopentenyl transferase** gene (Pssu-**ipt**)-**transformed** tobacco (Nicotiana tabacum L.) callus were quantified using electrospray-liquid chromatography-tandem mass spectrometry during a 6-week subcultivation period. An **ipt** gene was **expressed** under control of a tetracycline-inducible promoter for a more detailed study of cytokinin accumulation and metabolism. Activation of the **ipt** in both **expression** systems resulted in the production of mainly zeatin-type cytokinins. No accumulation of isopentenyladenine or isopentenyladenosine was observed. in Pssu-**ipt-transformed** calli, as well as in the tetracycline-inducible **ipt** leaves, metabolic inactivation occurred through O-glucoside conjugation. No significant elevation of cytokinin N-glucosides levels was observed. Side-chain reduction to dihydrozeatin-type cytokinins was observed in both systems. The levels of the endogenous cytokinins varied in time and were subject to homeostatic regulatory mechanisms. Feeding experiments of **ipt** transgenic callus with (3H)isopentenyladenine and (3H)isopentenyladenosine mainly led to labeled adenine-like compounds, which are degradation products from cytokinin-oxidase activity. Incorporation of radioactivity in zeatin riboside was observed, although to a much lesser extent.

1996

5/3,AB/23 (Item 14 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

10369360 BIOSIS NO.: 199698824278
Analysis of cytokinin biosynthetic gene **expression** in transgenic tobacco plants.
AUTHOR: Ma Qing-Hu
AUTHOR ADDRESS: Inst. Bot., Acad. Sinica, Beijing 100044**China
JOURNAL: Chinese Journal of Botany 7 (2):p104-108 **1995**
ISSN: 1001-0718
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The cytokinin biosynthetic gene coding for **isopentenyl transferase** (**ipt**) was cloned with its native promoter from Agrobacterium tumefaciens pTiAch58 and introduced into tobacco plants. To overcome the elevated cytokinin levels in suppressing the formation of roots, indolebutyric acid (IBA) was applied to regenerate morphologically normal transgenic tobacco plants. Northern hybridization revealed that the **ipt** mRNA level in these rooting plants were much lower than those in the primary **transformed** turnout tissues, and the root was the part in which the **ipt** gene mRNA level was the lowest in the plant. The determination of endogenous zeatin and zeatin riboside levels gave the same trend with the northern hybridization. These data suggest that the transgenic plants we obtained are a good model for studying the function and regulation of cytokinin in the whole plant levels.

1995

5/3,AB/24 (Item 15 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

10331301 BIOSIS NO.: 199698786219
Inflammatory pseudotumors of lymph node origin show macrophage-derived spindle cells and lymphocyte-derived cytokine transcripts without

evidence of T-cell receptor gene rearrangements: Implications for pathogenesis and classification as an idiopathic retroperitoneal fibrosis-like sclerosing immune reaction.
AUTHOR: Menke David M(a); Griesser Henrik; Araujo Iguaracyra; Foss Hans-Dieter; Herbst Hermann; Banks Peter M; Stein Harald
AUTHOR ADDRESS: (a)Mayo Clin. Jacksonville, 4500 San Pablo Rd., Jacksonville, FL 32224**USA
JOURNAL: American Journal of Clinical Pathology 105 (4):p430-439 **1996**
ISSN: 0002-9173
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Sclerosing pseudotumorous immune reactions of the retroperitoneum have been shown to consist of HLA-DR-positive spindle-shaped fibroblasts and macrophages that resemble fibroblasts, and in some instances they contain clonal populations of T lymphocytes not found in granulation tissue, keloids, nodular fasciitis, or fibromatoses. In patients who are iatrogenically immunosuppressed, circulating monocytes may be induced in vitro to **transform** into spindle-shaped macrophages, and secrete collagen after stimulation by conditioning medium from activated T lymphocytes. The authors investigated a series of five inflammatory pseudotumors (**IPT**) of lymph node origin for identification of spindle-shaped macrophages, T-cell receptor gene rearrangements, and lymphocyte-derived cytokine mRNA production. All cases of **IPT** demonstrated spindle-shaped macrophages resembling fibroblasts or myofibroblasts characterized by vimentin, CD45 (LCA), CD68 (KP1) or HAM-56, and HLA-DR (LN3) immunoreactivity and demonstrated production of procollagen-alpha-1 (1) mRNA by in situ hybridization. Clonal T-cell receptor chain gene rearrangements were undetectable by polymerase chain reaction. Strong specific lymphocyte-derived interleukin-1-beta and interleukin-6 mRNA cytokine transcripts were identified. Although all patients with **IPT** were managed with steroids and nonsteroidal anti-inflammatory medication, some had treatment-refractory disease. Because all-trans retinoic acid has been demonstrated to inhibit the in vitro **transformation** of monocytes into collagen-producing spindle-shaped macrophages ("neofibroblasts"), it may be of benefit for patients with **IPT**.
1996

5/3,AB/25 (Item 16 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

10157530 BIOSIS NO.: 199698612448
The effect of an elevated cytokinin level using the ipt gene and N-6-benzyladenine on single node and intact plant tuberization in vitro.
AUTHOR: Galis Vvan Jiri Macas(a); Vlasak Josef; Ondrej Milos; Van Onckelen Henri A
AUTHOR ADDRESS: (a)Inst. Plant Molecular Biol., Acad. Sci., Czech Republic, Branisovska 31, 370 05 Ceske Budejovice**Czech Republic
JOURNAL: Journal of Plant Growth Regulation 14 (3):p143-150 **1995**
ISSN: 0721-7595
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Two models of potato (Solanum tuberosum L.) tuberization in vitro (intact plants and single nodes) were used to study the role of cytokinins in this process. We applied hormone in two different ways. The exogenous addition of 10 mg cntdot L-1 N-6-benzyladenine (BA) into the tuberization medium resulted in advanced tuber formation in intact

plants, and microtubers appeared 10-20 days earlier than in the experiments in which no cytokinin was supplied. **Transformation** with the Agrobacterium tumefaciens **ipt** gene provided potato clones with endogenously elevated cytokinin levels (3-20 times higher zeatin riboside content in different clones). The onset of tuberization in intact **ipt-transformed** plants with low transgene **expression** was advanced in comparison with control material, and exogenously applied BA further promoted the tuberization process. On the contrary, tuberization was strongly inhibited in **ipt-transformed** nodes, and an external increase of the cytokinin level caused complete inhibition of explant growth. In untransformed (control) nodes cytokinin application resulted in primary and secondary tuber formation, which depended on the BA concentration in cultivation media..

1995

5/3,AB/26 (Item 17 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

10003903 BIOSIS NO.: 199598458821
Expression of a wound-inducible cytokinin biosynthesis gene in transgenic tobacco: Correlation of root **expression** with induction of cytokinin effects.
AUTHOR: Smigocki Ann C
AUTHOR ADDRESS: Plant Molecular Biology Lab., USDA/ARS, 10300 Baltimore Ave., Build. 006, Room 118, Beltsville, MD 2**USA
JOURNAL: Plant Science (Limerick) 109 (2):p153-161 **1995**
ISSN: 0168-9452
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The Agrobacterium-derived cytokinin-biosynthesis gene **ipt** was fused to the wound-inducible proteinase-inhibitor-IIK gene promoter from potato and introduced into Nicotiana plumbaginifolia and N. tabacum. Maximum accumulation of **ipt** transcripts in the leaves of transgenic plants was observed within 3-24 h after leaf wounding. Root and stem **ipt** messages were not detected in unwounded transgenic N. plumbaginifolia PI-II-**ipt** seedlings until after the plants bolted whereas in N. tabacum, a relatively low level of root and stem **expression** was evident only prior to stem elongation and not detected after the plants bolted. Atypical cytokinin effects were observed with the N. plumbaginifolia but not N. tabacum **transformants**. Transgenic N. plumbaginifolia plants bolted sooner, were taller than control plants and had larger leaves with lower specific fresh weights and chlorophyll content. At flowering, the emergence of numerous lateral shoots from lower stem sections and basal leaf greening followed the moderate increase in root **ipt** transcripts and corresponded to a greater than 100-fold increase in zeatin and zeatinriboside cytokinin concentrations. The **expression** pattern of the PI-II-**ipt** gene followed that of the PI-IIK gene and, when **expressed** in the root, corresponded with induction of characteristic cytokinin effects.

1995

5/3,AB/27 (Item 18 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

09975304 BIOSIS NO.: 199598430222

Effect of Auxin on **Expression** of the **Isopentenyl Transferase** Gene (**ipt**) in **Transformed** Bean (Phaseolus vulgaris L.) Single-Cell Clones Induced by Agrobacterium tumefaciens C58.
AUTHOR: Song Jai Young; Choi Eun Yeung; Lee Hyeun Se; Choi Dong-Woog; Oh Man-Ho; Kim Sang-Gu(a)
AUTHOR ADDRESS: (a)Dep. Biol. Res. Cent. Cell Differentiation, Seoul Natl. Univ., Seoul 151-742**South Korea
JOURNAL: Journal of Plant Physiology 146 (1-2):p148-154 **1995**
ISSN: 0176-1617
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The effect of auxin on the endogenous cytokinin content and on the **expression** of **isopentenyl transferase** gene (**ipt**) was investigated in bean (Phaseolus vulgaris L. cv. Palgong) tumor single-cell clones induced by Agrobacterium tumefaciens C58. The major endogenous cytokinins of tumor single-cell clones were zeatin and zeatin riboside. Endogenous zeatin and zeatin riboside levels in tumor single-cell clones cultured on an auxin-supplemented medium were reduced by six-fold and eight-fold, respectively, while tumor single-cell clones cultured on the 5.0 mu-M kinetin-supplemented medium did not exhibit any reduction in the levels of these cytokinins. The mRNAs isolated from normal single-cell clones cultured on 5.0 mu-M kinetin and 2.5 mu-M picloram-supplemented medium, from **transformed** single-cell clones cultured on hormone-free medium, and from **transformed** single-cell clones cultured on 2.5 mu-M picloram-supplemented medium, were subjected to Northern blot hybridization. The **ipt** transcript was not detected in tumor single-cell clones cultured on picloram-supplemented medium, but the **ipt** mRNA was detected in tumor single-cell clones cultured on hormone-free medium. The amount of **ipt** mRNA in tumor single-cell clones was found to decrease with time in cultures grown on picloram-supplemented medium. The nopaline synthase gene (nos) transcript was detected in the tumor single-cell clones from both culture conditions. It is concluded that picloram regulates the **ipt** mRNA steady state level, either at the transcriptional level or by affecting **ipt** mRNA stability.

1995

5/3,AB/28 (Item 19 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

09832302 BIOSIS NO.: 199598287220
The effect of auxin on cytokinin levels and metabolism in transgenic tobacco tissue **expressing** an **ipt** gene.
AUTHOR: Zhang R; Zhang X; Wang J; Letham D S(a); McKinney S A; Higgins T J V
AUTHOR ADDRESS: (a)Cooperative Res. Cent. Plant Sci., Australian Natl. Univ., PO Box 475, Canberra, ACT 2601**Australia
JOURNAL: Planta (Heidelberg) 196 (1):p84-94 **1995**
ISSN: 0032-0935
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The **ipt** gene from the T-DNA of Agrobacterium tumefaciens was transferred to tobacco (Nicotiana tabacum L.) in order to study the control which auxin appears to exert over levels of cytokinin generated by **expression** of this gene. The transgenic tissues contained elevated levels of cytokinins, exhibited cytokinin and auxin autonomy and grew as shooty calli on hormone-free media. Addition of 1-naphthylacetic

acid to this culture medium reduced the total level of cytokinins by 84% while 6-benzylaminopurine elevated the cytokinin level when added to media containing auxin. The cytokinins in the transgenic tissue were labelled with 3H and auxin was found to promote conversion of zeatin-type cytokinins to 3H-labelled adenine derivatives. When the very rapid metabolism of exogenous (3H)zeatin riboside was suppressed by a phenylurea derivative, a noncompetitive inhibitor of cytokinin oxidase, auxin promoted metabolism to adenine-type compounds. Since these results indicated that auxin promoted cytokinin oxidase activity in the **transformed** tissue, this enzyme was purified from the tobacco tissue cultures. Auxin did not increase the level of the enzyme per unit tissue protein, but did enhance the activity of the enzyme in vitro and promoted the activity of both glycosylated and non-glycosylated forms. This enhancement could contribute to the decrease in cytokinin level induced by auxin. Studies of cytokinin biosynthesis in the transgenic tissues indicated that transhydroxylation of isopentenyladenine-type cytokinins to yield zeatin-type cytokinins occurred principally at the nucleotide level.

1995

5/3,AB/29 (Item 20 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

09765648 BIOSIS NO.: 199598220566
Increase of endogenous zeatin riboside by introduction of the **ipt** gene in wild type and the lateral suppressor mutant of tomato.
AUTHOR: Groot Steven P C(a); Bouwer Reinoud(a); Busscher Marco(a); Lindhout Pim; Dons Hans J(a)
AUTHOR ADDRESS: (a)Dep. Dev. Biol., Cent. Plant Breed. Reprod. Res., P.O. Box 16, NL-6700 AA Wageningen**Netherlands
JOURNAL: Plant Growth Regulation 16 (1):p27-36 **1995**
ISSN: 0167-6903
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: We studied axillary meristem formation of the lateral suppressor (ls) mutant of tomato after elevating the endogenous cytokinin levels through introduction of the isopentenyltransferase (**ipt**) gene from Agrobacterium tumefaciens. Growth and development of several **transformants** were examined during in vitro culture. **Transformants** exhibited phenotypes varying in severity and were divided into four classes. A number of the **ipt transformants** had a normal phenotype, as non-**transformed** plants. Others showed a mild to severe 'cytokinin-like' phenotype. **Transformants** with a mild phenotype exhibited reduced internode length and reduced root development. **Transformants** with a severe phenotype showed even shorter internodes, loss of apical dominance, reduction of leaf size, production of callus at the basis of the shoots and absence of root development or development of green non-branching roots. The severity of the phenotype correlated well with the level of **ipt** gene **expression**, as measured by northern analysis. **Transformants** with a severe phenotype also exhibited increased levels of zeatin riboside, but zeatin levels were not elevated. The increase in endogenous zeatin riboside levels in the ls mutant did not restore axillary meristem formation, but sometimes bulbous structures were formed in the initially 'empty' leaf axils. Several adventitious meristems and shoots developed from below the surface of these structures. It is concluded that a reduced level of cytokinins in the ls mutant shoots is not responsible for the absence of axillary meristem formation.

1995

5/3,AB/30 (Item 21 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

09716852 BIOSIS NO.: 199598171370
Production of high solids tomatoes through molecular modification of levels of the plant growth regulator cytokinin.
AUTHOR: Martineau Belinda(a); Summerfelt Kristin R; Adams Dawn F; Deverna Joseeph W
AUTHOR ADDRESS: (a)Calgene Inc., 1920 Fifth St., Davis, CA 95616**USA
JOURNAL: Bio-Technology (New York) 13 (3):p250-254 **1995**
ISSN: 0733-222X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Chimeric **isopentenyl transferase** (**ipt**) gene constructs were prepared and introduced into tomato plants via Agrobacterium-mediated **transformation**. **Expression** of the **ipt** gene, which encodes a key enzyme involved in the biosynthesis of the plant growth regulator cytokinin, was modulated using a promoter from a gene **expressed** primarily in tomato ovaries. As expected, the **ipt** gene was **expressed**, and levels of cytokinin were increased in ovaries of the transgenic plants. Plant yield and fruit processing characteristics of these transgenic plants were examined during three consecutive years of field testing. Levels of total solids were significantly increased in six of seven, and soluble solids were significantly increased in five of seven, independent transgenic tomato lines.

1995

5/3,AB/31 (Item 22 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

09446154 BIOSIS NO.: 199497454524
Transgenic tobacco plants that overproduce cytokinins show increased tolerance to exogenous auxin and auxin transport inhibitors.
AUTHOR: Li Yi; Shi Xiangyang; Strabala Timothy J; Hagen Gretchen; Guilfoyle Tom J(a)
AUTHOR ADDRESS: (a)Dep. Biochem., 117 Schweitzer Hall, Univ. Missouri, Columbia, MO 65211**USA
JOURNAL: Plant Science (Limerick) 100 (1):p9-14 **1994**
ISSN: 0168-9452
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Transgenic tobacco plants **expressing** the Agrobacterium tumefaciens cytokinin biosynthetic **ipt** gene under the control of an auxin-inducible SAUR (Small Auxin-Up RNA) gene promoter were used to study interactions between exogenously applied auxins or auxin transport inhibitors and endogenously produced cytokinins. The transgenic plants used in this study had cytokinin levels about 10-fold higher than non-**transformed** tobacco plants. In aseptic culture, the transgenic tobacco plants exhibited increased tolerance to the toxic effects of high concentrations of exogenously applied auxins. This tolerance is exemplified by increased plant height and fresh weight in transgenic plants treated with auxin compared to similarly treated non-

transformed plants. In addition to increased tolerance to exogenous auxins, the transgenic plants showed increased tolerance to applied auxin transport inhibitors.

1994

5/3,AB/32 (Item 23 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

09261434 BIOSIS NO.: 199497269804
Fruit-specific **expression** of the A. tumefaciens **isopentenyl transferase** gene in tomato: Effects on fruit ripening and defense-related gene **expression** in leaves.
AUTHOR: Martineau Belinda(a); Houck Catherine M; Sheehy Raymond E; Hiatt William R
AUTHOR ADDRESS: (a)Calgene Fresh Inc., 1910 Fifth St., David, CA 95616**USA
JOURNAL: Plant Journal 5 (1):p11-19 **1994**
ISSN: 0960-7412
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: This paper describes the analysis of tomato plants **transformed** with a chimeric gene consisting of the promoter region of a fruit specifically **expressed** tomato gene linked to the **ipt** gene coding sequences from the Ti plasmid of Agrobacterium tumefaciens. The pattern of **expression** of this chimeric gene was found to be consistent with the **expression** of the endogenous fruit-specific gene and consequently, plants **expressing** the chimeric gene were phenotypically normal until fruit maturation and ripening. A dramatically altered fruit phenotype, islands of green pericarp tissue remaining on otherwise deep red ripe fruit, was then evident in many of the **transformed** plants. Cytokinin levels in **transformed** plant fruit tissues were 10 to 100-fold higher than in control fruit. In the leaves of a fruitbearing **transformant**, despite a lack of detectable **ipt** mRNA accumulation, approximately fourfold higher than control leaf levels of cytokinin were detected. It is suggested that cytokinin produced in fruit is being transported to the leaves since accumulation in leaves of PR-1 and chitinase mRNAs, which encode defense-related proteins known to be induced by cytokinin, occurred only when the **transformant** was reproductively active. Effects of elevated cytokinin levels on tomato fruit gene **expression** and cellular differentiation processes are also described.

1994

5/3,AB/33 (Item 24 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

09188845 BIOSIS NO.: 199497197215
Cytokinins modulate stress response genes in **isopentenyl transferase-transformed** Nicotiana plumbaginifolia plants.
AUTHOR: Harding S A; Smigocki A C(a)
AUTHOR ADDRESS: (a)Plant Mol. Biol. Lab., USDA/ARS Beltsville, MD 20705** USA
JOURNAL: Physiologia Plantarum 90 (2):p327-333 **1994**
ISSN: 0031-9317
DOCUMENT TYPE: Article
RECORD TYPE: Abstract

LANGUAGE: English

ABSTRACT: The effects of transiently elevated cytokinin levels on gene **expression** following stress were examined in transgenic Nicotiana plumbaginifolia plants. Plants were **transformed** with a bacterial gene encoding **isopentenyl transferase** (**ipt**) cloned behind the heat shock (HS) protein 70 promoter from Drosophila melanogaster. Following a 1-h, 45 degree C HS of whole plants, the **ipt** transcript levels in leaves increased 30- to 40-fold. Analysis of in vitro translation products of leaf messenger RNA showed rapid **isopentenyl transferase**-dependent changes in gene **expression**. A subset comprising 1 to 2% of resolvable translation products was specifically up-regulated in heat shock **ipt**-inducible (HS-**ipt**) plants. Several cDNA clones were isolated which correspond to mRNAs that are up-regulated 2- to 4-fold in HS-**ipt** plants. Two of the cDNAs encode stress-related polypeptides, one a member of a class of small heat shock polypeptides (HSP) and the other, a wound-inducible glycine-rich protein. Benzylaminopurine feeding experiments show that the HSP transcripts are up-regulated by other treatments including watering but that cytokinins strongly accelerate or amplify the response. These data are the first to show altered modulation of stress-induced genes in intact plants **transformed** with the cytokinin biosynthesis gene **ipt**.

1994

5/3,AB/34 (Item 25 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

09081205 BIOSIS NO.: 199497089575
Morphometric analysis of the growth of Phsp70-**ipt** transgenic tobacco plants.
AUTHOR: Van Loven Karen; Beinsberger Susy E I; Valcke Roland L M(a); Van Onckelen Henri A; Clijsters Herman M M
AUTHOR ADDRESS: (a)Limburgs Universitair Centrum, Dept. SBG, Universitaire Campus, B-3590 Diepenbeek**Belgium
JOURNAL: Journal of Experimental Botany 44 (268):p1671-1678 **1993**
ISSN: 0022-0957
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The effect of introducing a supplementary **ipt**-gene into the genome of Nicotiana tabacum L. cv. Petit Havana SR1 is studied on the morphological plant development. The **ipt**-gene, accounting for the biosynthesis of cytokinins, was coupled to the heat-inducible hsp70-promoter from Drosophila melanogaster. Besides the influence of the hormonal changes involved, the effects of the experimental conditions are examined, namely the in vitro growth conditions for selecting **transformed** plants and the heat treatment to induce **ipt**-gene **expression**. The phenotype of the plants is determined by the tissue sensitivity to three factors: (1) heat treatment reduces stem elongation and diameter growth; (2) in vitro pre-cultivation also reduces stem elongation; and (3) **expression** of the **ipt**-gene stimulates diameter growth, induces debudding of the axillary shoots and inhibits root development. In addition, axillary bud development indicates that in vitro cultivation affects **ipt**-gene **expression**.

1993

5/3,AB/35 (Item 26 from file: 5)

DIALOG(R)File 5:Biosis Previews(R)

09042189 BIOSIS NO.: 199497050559
Alterations in auxin and cytokinin metabolism of higher plants due to **expression** of specific genes from pathogenic bacteria: A review.
AUTHOR: Hamill John D
AUTHOR ADDRESS: Dep. Genet. Dev. Biol., Monash Univ., Clayton, VIC 3168** Australia
JOURNAL: Australian Journal of Plant Physiology 20 (4-5):p405-423 **1993**
ISSN: 0310-7841
DOCUMENT TYPE: Literature Review
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: This review deals with the physiological and morphological effects of altering the auxin/cytokinin balance in transgenic plants by **expressing** specific genes from pathogenic bacteria. Genes which have been used to alter auxin levels or sensitivity in transgenic plants include the iaaM/iaaH genes from Agrobacterium tumefaciens and A. rhizogenes; gene 5 and possibly gene 6b from A. tumefaciens; the rol B and possibly the rol A gene from A. rhizogenes and the iaaL gene from Pseudomonas syringae subsp. savastanoi (P. savastanoi). Genes which have been used to alter cytokinin levels in transgenic plants include the **ipt** gene from A. tumefaciens and the rol C gene from A. rhizogenes. A variety of biochemical mechanisms have been identified which result in alterations to phytohormone levels following **expression** of these genes in transgenic plants. Many of the effects on plant development are consistent with observations made following exogenous auxin and/or cytokinin application to plant tissues, and the availability of these genes offers a new approach to the study of plant physiology using **transformation** methodology.

1993

5/3,AB/36 (Item 27 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

08936028 BIOSIS NO.: 199396087529
Expression of a cytokinin synthesis gene from Agrobacterium tumefaciens T-DNA in basket willow (Salix viminalis).
AUTHOR: Vahala T(a); Eriksson T; Tillberg E; Nicander B
AUTHOR ADDRESS: (a)Dep. Molecular Genetics, Swedish Univ. Agricultural Sciences, Box 7003, S-75006 Uppsala**Sweden
JOURNAL: Physiologia Plantarum 88 (3):p439-445 **1993**
ISSN: 0031-9317
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Willow cells **transformed** with an **ipt** gene from Agrobacterium tumefaciens grow in tissue culture as undifferentiated callus without shoot induction. We show that the **transformed** calluses contained high levels of the cytokinins 9-beta-D-ribofuranosyl zeatin and its monophosphate, demonstrating the presence of a functional **isopentenyl transferase** enzyme. The **ipt** gene was transcribed at different levels in different **transformed** callus fines. The absence of shoot differentiation is apparently not due to a lack of zeatin-type cytokinins in the **transformed** callus.

1993

5/3,AB/37 (Item 28 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

08924035 BIOSIS NO.: 199396075536
Construction of a Chlamydomonas reinhardtii mutant with an intronless psbA gene.
AUTHOR: Johanningmeier Udo; Heiss Silvia
AUTHOR ADDRESS: Ruhr-Univ. Bochum, Lehrstuhl Biochemie Pflanzen, Postfach 102148, D-4630 bochum**Germany
JOURNAL: Plant Molecular Biology 22 (1):p91-99 **1993**
ISSN: 0167-4412
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Efficient chloroplast **transformation** systems now available allow the manipulation of the evolutionarily highly conserved psbA gene in the eucaryotic organism Chlamydomonas reinhardtii. Two copies of this gene in the inverted repeat region of the chloroplast genome contain four large group I introns. To analyse possible functions of these introns and to generate a mutant for simplified psbA gene manipulations, a psbA cDNA fragment was introduced into a psbA deletion mutant using the biolistic **transformation** method. A **transformant** with no introns in the psbA gene has been obtained and represents the first example of the removal of a complete set of introns from a chloroplast gene. The newly generated strain is photosynthetically competent and contains no detectable recipient genome copies. The loss of all four introns appears to be phenotypically silent.

1993

5/3,AB/38 (Item 29 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

08807668 BIOSIS NO.: 199395097019
Transmission and **expression** of T-DNA of normal-appearing tobacco regenerants **transformed** by Agrobacterium tumefaciens C58.
AUTHOR: Choi Dong-Woog; Kim Sang-Gu(a)
AUTHOR ADDRESS: (a)Dep. Biol., Seoul Natl. Univ., Seoul 151-742**North Korea
JOURNAL: Korean Journal of Genetics 14 (3):p223-233 **1992**
ISSN: 0254-5934
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Transgenic tobacco plants have been regenerated from **transformed** callus tissues produced by the cocultivation of tobacco (Nicotiana tabacum L.) protoplasts with Agrobacterium tumefaciens C58. More than a half of regenerants exhibited normal-appearing vegetative morphology and produced progeny seeds(F-1) by self-pollination. The F-2 seeds were obtained from crosses between F-1 plants and normal tobacco plants. Most of F-1 and F-2 plants appeared phenotypically normal. However, some of F-1 and F-2 plants showed hyperstyly flowers and remained sterile. Nopaline synthase (nos) gene sequence from **transformed** callus tissue was restricted by HpaII but nos genes of F-1 and F-2 plants were not restricted. Transcripts of isophenthenyl transferase (**ipt**) and nos genes were detected from tumour callus tissues, but were not detected in normal-appearing F-a and F-2 plants.

The results indicated that the T-DNA of normal-appearing F-1 and F-2 plants might be methylated and be suppressed for transcription.

1992

5/3,AB/39 (Item 30 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

07949577 BIOSIS NO.: 000093028675
REGENERATION OF PLANTS FROM PEACH EMBRYO CELLS INFECTED WITH A SHOOTY MUTANT STRAIN OF AGROBACTERIUM
AUTHOR: SMIGOCKI A C; HAMMERSCHLAG F A
AUTHOR ADDRESS: U.S. DEP. AGRIC., AGRIC. RES. SERV., PLANT MOL. BIOL. LAB., BELTSVILLE, MD. 20705, USA.
JOURNAL: J AM SOC HORTIC SCI 116 (6). 1991. 1092-1097. **1991**
FULL JOURNAL NAME: Journal of the American Society for Horticultural Science
CODEN: JOSHB
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: Immature 'Redhaven' peach [Prunus persica (L.) Batsch] embryos were infected with a shooty mutant strain of Agrobacterium tumefaciens, tms328::Tn5, which carries an octopine-type Ti plasmid with a functional cytokinin gene and a mutated auxin gene. Shoots were regenerated from embryo-derived callus that was initiated on MS medium lacking phytohormones. Shoots exhibit increased frequency of branching and were more difficult to root than the noninfected. Transcripts of the tms328::Tn5-cytokinin gene were detected using northern analyses of total plant RNA. Polymerase chain reaction of genomic DNA and cDNA resulted in amplification of DNA fragments specific for the cytokinin gene, as determined by restriction enzyme and Southern analyses. The concentrations of the cytokinins zeatin and zeatin riboside in the leaves of regenerated plants were on the average 51-fold higher than in leaves taken from nontransformed plants. None of the shoots or callus tissues were positive for octopine. The **expression** of the T-DNA encoded cytokinin gene promotes growth of peach cells in the absence of phytohormones, thus serving as a marker for **transformation**. In addition, this gene appears to promote morphogenesis without an auxin inductive step.

1991

5/3,AB/40 (Item 31 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

07400418 BIOSIS NO.: 000091016028
RESTORATION OF SHOOTY MORPHOLOGY OF A NONTUMOROUS MUTANT OF NICOTIANA-GLAUCA X NICOTIANA-LANGSDORFFII BY CYTOKININ AND THE ISOPENTENYLTRANSFERASE GENE
AUTHOR: FENG X-H; DUBE S K; BOTTINO P J; KUNG S-D
AUTHOR ADDRESS: CENT. AGRIC. BIOTECHNOL., UNIV. MD., COLLEGE PARK, MD. 20742.
JOURNAL: PLANT MOL BIOL 15 (3). 1990. 407-420. **1990**
FULL JOURNAL NAME: Plant Molecular Biology
CODEN: PMBID
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: The shooty morphology of a nontumorous amphidiploid mutant of

Nicotiana glauca Grah. .times. N. langsdorffii Weinm. was restored by cytokinins, whether exogenously applied or endogenously produced by **transformation** of the mutant with a transfer DNA (T-DNA) cytokinin-biosynthesis gene (isopentenyltransferase; **ipt**). Auxins alone did not confer this effect. Similar **transformation** was not achieved for the parental species. In the case of **transformation** with the **ipt** gene, selection of the **transformed** tissues was based on its hormone-independent growth in the presence of the antibiotic kanamycin. **Transformed** tissues exhibited a shooty morphology, indistinguishable from the of wildtype genetic tumors N. glauca .times. N. langsdorffii. This altered phenotype was caused by the presence and constitutive **expression** of the **ipt** gene. the insertion and **expression** of this gene in **transformed** tissues was confirmed by using the polymerase chain reaction (PCR) technique as well as conventional molecular hybridization analysis. **Expression** of the **ipt** gene led to an elevated level of cytokinin in the **transformed** mutant tissues. This evidence supports the notion that genetic tumors are caused, at least in part, by elevated levels of cytokinin interspecific hybrids.

1990

5/3,AB/41 (Item 32 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

07282799 BIOSIS NO.: 000090062686
AGROBACTERIUM-MEDIATED **TRANSFORMATION** OF THE CULTIVATED STRAWBERRY FRAGARIA-ANANASSA DUCH. USING DISARMED BINARY VECTORS
AUTHOR: JAMES D J; PASSEY A J; BARBARA D J
AUTHOR ADDRESS: INST. HORTICULTURAL RESEARCH, EAST MALLING, MAIDSTONE, KENT, ME19 6BJ, UK.
JOURNAL: PLANT SCI (LIMERICK) 69 (1). 1990. 79-94. **1990**
CODEN: PLSCE
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: Two disarmed Ti-binary vectors in Agrobacterium tumefaciens have been used to produce viable transgenic strawberry plants. Fertile strawberry plants with a normal phenotype were regenerated after **transformation** with pBIN6, which carries genes for nopaline synthase (nos) and neomycin phosphotransferase (nptII) (conferring kanamycin resistance). The transfer and **expression** of the two genes was confirmed by Southern blot analysis, the detection of nopaline synthase (NOS) activity in vegetative and reproductive tissues and rooting in vitro in the presence of kanamycin. The nos gene continued to be **expressed** in glasshouse-grown plants many months after removal from in vitro growth conditions. After selfing the RO plants nos segregated in the R1 progeny according to a 3:1 Mendelian ratio. In in vitro germinated seedlings there was complete correlation between the presence of nopaline synthase activity and the ability of leaf segments to produce callus on a medium containing kanamycin. Transgenic clones that exhibited an abnormal phenotype associated with cytokinin overproduction were produced when plants were **transformed** with pSS1, a derivative of pBIN19 carrying both the nptII gene and the **ipt** gene (encoding the enzyme isopentenyltransferase). Shoots of these clones grew on hormone-free medium, could not be induced to root and their growth was unaffected by the presence of 50 .mu.g/ml kanamycin in hormone-free media.

1990

5/3,AB/42 (Item 33 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

06925388 BIOSIS NO.: 000089058780
TRANSFER OF THE AGROBACTERIAL CYTOKININ BIOSYNTHESIS GENE INTO TOBACCO PLANTS
AUTHOR: YUSIBOV V M; POGOSYAN G P; ANDRIANOV V M; PIRUZYAN E S
AUTHOR ADDRESS: INST. MOL. GENET., ACAD. SCI. USSR, MOSCOW, USSR.
JOURNAL: MOL GENET MIKROBIOL VIRUSOL 0 (7). 1989. 11-13. **1989**
FULL JOURNAL NAME: Molekulyarnaya Genetika Mikrobiologiya i Virusologiya
CODEN: MGMVD
RECORD TYPE: Abstract
LANGUAGE: RUSSIAN

ABSTRACT: The gene transfer into plants using the genetic engineering methods gives us the possibility to obtain transgeneric plants having acquired the new traits. Some bacterial genes can be used for this purpose. Obtaining of a transgeneric plant harbouring the cytokinin synthesis gene **ipt** (gene 4) from the T-DNA of Agrobacterium tumefaciens Ti-plasmid seems to be useful. The **expression** of tumor agrobacterial **ipt** gene in **transformed** plant cells interferes with the normal growth and regulation of the whole plant. The successful transfer of the cloned **ipt** gene from the recombinant plasmid pGV0319 into the tobacco plant using Agrobacterium vectors and succeeding regeneration of phenotypically normal transgenic plants are reported in the present paper.

1989

5/3,AB/43 (Item 34 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

06666208 BIOSIS NO.: 000087108385
CYTOKININ ANTAGONIST ACTIVITY OF SUBSTITUTED PHENETHYLAMINES IN PLANT CELL CULTURE
AUTHOR: CHRISTOU P; BARTON K A
AUTHOR ADDRESS: AGRACETUS, 8420 UNIVERSITY GREEN, MIDDLETON, WI 53562.
JOURNAL: PLANT PHYSIOL (BETHESDA) 89 (2). 1989. 564-568. **1989**
FULL JOURNAL NAME: Plant Physiology (Bethesda)
CODEN: PLPHA
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: A series of structurally related substituted phenethylamines shows extreme toxicity toward wild-type callus tissue cultures of tobacco (Nicotiana tabacum), soybean (Glycine max), corn (Zea mays), and sunflower (Helianthus annuus L.), but tobacco crown gall cultures are resistant to the compounds. The essential components that result in toxicity of the phenethylamines include one aromatic hydroxyl and one primary aliphatic amino group. A series of attenuated crown gall cultures, generated by **transformation** of tobacco with various modified Agrobacterium strains, has been used to demonstrate that the resistance of crown galls to the phenethylamines is due to the **expression** in these tissues of **isopentenyl transferase**, a first step in cytokinin biosynthesis. The toxicity of the compounds to tissues cultures is very rapid, but can be overcome by prior exposure of the calli to exogenous cytokinin. Because of the relationships we have observed between cytokinins and these compounds, we propose that the substituted phenethylamines may represent a class of chemicals that can be used as specific probes to further an understanding of cytokinin metabolism in plant tissues.

1989

5/3,AB/44 (Item 35 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

06246363 BIOSIS NO.: 000086080545
DNASE I SENSITIVITY OF THE T DNA **IPT** GENE IS ASSOCIATED WITH GENE **EXPRESSION**
AUTHOR: REID R A; JOHN M C; AMASINO R M
AUTHOR ADDRESS: DEP. BIOCHEM., COLL. AGRIC. AND LIFE SCI., UNIV. WISCONSIN-MADISON, MADISON, WIS. 53706.
JOURNAL: BIOCHEMISTRY 27 (15). 1988. 5748-5754. **1988**
FULL JOURNAL NAME: Biochemistry
CODEN: BICHA
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: We have analyzed the chromatin structure of the T-DNA **isopentenyl transferase** gene, **ipt**, in four Nicotiana tobacum crown gall tumor lines. These four **transformed** lines contain identical T-DNA inserts and are derivatives of a single clone that did not exhibit any tumours properties and contained a highly methylated, nonexpressed copy of T-DNA. One of the derivatives also does not exhibit tumorous properties, and the T-DNA of this line is not **expressed**. The other three lines have reverted to tumorous growth either spontaneously or after treatment with the inhibitor of DNA methylation, 5-azacytidine. Concomitant with this reversion to tumorous growth, **expression** of the **ipt** gene of these lines has reinitiated. In the lines that **express** the **ipt** gene, the chromatin structure of this gene exists in a conformation that is more accessible to DNase I than in the line in which this gene is not **expressed**. The level of **ipt expression** and DNase I sensitivity was independent of the process by which the **transformed** cell lines reverted to tumorous growth. The relationship of chromatin structure to gene **expression** and DNA methylation in these lines is discussed.

1988

5/3,AB/45 (Item 36 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

06163519 BIOSIS NO.: 000085126671
HORMONAL REGULATION OF ZEATIN-RIBOSIDE ACCUMULATION BY CULTURED TOBACCO CELLS
AUTHOR: HANSEN C E; MEINS F JR; AEBI R
AUTHOR ADDRESS: FRIEDRICH MIESCHER-INST., P.O. BOX 2543, CH-4002 BASEL, SWITZERLAND.
JOURNAL: PLANTA (BERL) 172 (4). 1987. 520-525. **1987**
FULL JOURNAL NAME: PLANTA (Berlin)
CODEN: PLANA
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: Auxin (11 .mu.M .alpha.-naphthaleneacetic acid) and cytokinin (1.4 .mu.M kinetin) regulate cytokinin accumulation by cytokinin-requiring (C-) and cytokinin-autotrophic (C+) lines of Havana 425 tobacco (Nicotiana tabacum L.) tissues. No trans-zeatin riboside (ZR) (< 0.5 pmol .cntdot. g-1 fresh weight) was detected in six C- and nine C+

lines grown for 14 d on auxin + cytokinin and auxin medium, respectively. C+ lines, but not C- lines accumulated ZR (1.9-51. p mol .cntdot. g-1 fresh weight) when incubated on hormone-free medium but both lines accumulated ZR when incubated on kinetin medium. Therefore, it appears that kinetin treatment can induce ZR accumulation and that this accumulation is blocked by auxin treatment. Similar effects were obtained with some lines of cells autotrophic for both auxin and cytokinin. Tobacco plants carrying the dominant Habituated leaf-1 allele (Hl-1) differ from wild-type plants in that leaf-derived tissues in culture exhibit a C+ phenotype. No differences in ZR content were found in C+ leaf tissues from Hl-1/Hl-1 plants and C+ tissues that arise epigenetically in wild-type plants. This indicates that the H-1 allele does not act to induce overproduction of ZR. The Hl-1 allele is known to have oncogenic functions similar to the **isopentenyl transferase** (**ipt**) locus of the Ti plasmid. Although Hl-1/Hl-1 cells **transformed** with Ti plasmids defective at the **ipt** locus are tumorigenic and hormone-autotrophic in culture, they contain low levels of ZR typical of non-**transformed** Hl-1 Hl-1 cells. Therefore, the high levels of ZR characteristic of cells **transformed** with wild-type Ti plasmids are not necessary for **expression** of the tumor phenotype.

1987

5/3,AB/46 (Item 37 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

06063253 BIOSIS NO.: 000085026402
TWO AGROBACTERIUM-TUMEFACIENS GENES FOR CYTOKININ BIOSYNTHESIS TI PLASMID-CODED ISOPENTENYLTRANSFERASES ADAPTED FOR FUNCTION IN PROKARYOTIC OR EUKARYOTIC CELLS
AUTHOR: HEINEMEYER W; BUCHMANN I; TONGE D W; WINDASS J D; ALT-MOERBE J; WEILER E W; BOTZ T; SCHROEDER J
AUTHOR ADDRESS: INST. BIOL. II, UNIV. FREIBURG, SCHAENZLESTR. 1, D-7800 FREIBURG, FRG.
JOURNAL: MOL GEN GENET 210 (1). 1987. 156-164. **1987**
FULL JOURNAL NAME: Molecular & General Genetics
CODEN: MGGEA
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: Tzs and **ipt** are two Ti plsmid genes coding for proteins with isopentenyltransferase (**IPT**) activity in vitro. We cloned both genes for protein **expression** in Escherichia coli and in Agrobacterium tumefaciens, and we investigated differences between the two genes by analysing the properties of the proteins in vitro and in vivo. In vitro, extracts with tzs or **ipt**-coded proteins had high **IPT** activity, and the enzymes were identical in most properties. The most important difference was detected in vivo: the tzs-encoded protein was very active in cytokinin production, while the **ipt** protein required overexpression in order to obtain measurable activity in bacteria. In both cases, trans-zeatin was the major product of the gene activity. Formation of this cytokinin requires a hydroxylase function in addition to the **IPT** reaction. No such activity could be ascribed to tzs or **ipt**-encoded proteins in vitro or in vivo, but cytokinin hydroxylase activity was detected in cells and extracts of E. coli regardless of the presence or absence of the cytokinin genes. Based on these results it is proposed that both genes code for a single enzyme activity (isopentenyltransferase), that the genes and the proteins are adapted for function either in bacteria (tzs) or in **transformed** plant cells (**ipt**), and that in both prokaryotic and eukaryotic cells hydroxylation to trans-zeatin is a function contributed by host

enzymes.

1987

5/3,AB/47 (Item 38 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

05764106 BIOSIS NO.: 000084112513
INITIATION OF AUXIN AUTONOMY IN NICOTIANA-GLUTINOSA CELLS BY THE CYTOKININ-BIOSYNTHESIS GENE FROM AGROBACTERIUM-TUMEFACIENS
AUTHOR: BINNS A N; LABRIOLA J; BLACK R C
AUTHOR ADDRESS: DEP. BIOL., UNIV. PENNSYLVANIA, PHILADELPHIA, PA. 19104-6018.
JOURNAL: PLANTA (BERL) 171 (4). 1987. 539-548. **1987**
FULL JOURNAL NAME: PLANTA (Berlin)
CODEN: PLANA
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: Agrobacteria carrying mutations at the auxin-biosynthesizing loci (iaaH and iaaM of the Ti plasmid) induce shoot-forming tumors on many plant species. In some cases, e.g. Nicotiana glutinosa L., tumors induced by such mutant strains exhibit an unorganized and fully autonomous phenotype. These characteristics are stable in culture at both the tissue and cellular level. We demonstrate that the cytokinin-biosynthesis gene (**ipt**) of the Ti plasmid is responsible for the induction of both auxin and cytokinin autonomy in N. glutinosa. Cloned cell lines carrying an **ipt** gene but lacking iaaH and iaaM are capable of accumulating indole-3-acetic acid. Interestingly, non-**transformed** N. glutinosa tissues exhibit an auxin-requiring phenotype when they are grown on medium supplemented with an exogenous supply of cytokinin. These results strongly indicate that exogenously supplied cytokinin does not mimic all the effects of the **expression** of the **ipt** gene in causing the auxin-autonomous growth of N. glutinosa cells.

1987

5/3,AB/48 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

07975638 Genuine Article#: 231GU Number of References: 31
Title: Effective selection system for generating marker-free transgenic plants independent of sexual crossing (ABSTRACT AVAILABLE)
Author(s): Sugita K; Matsunaga E; Ebinuma H (REPRINT)
Corporate Source: NIPPON PAPER IND CO LTD,CENT RES LAB, KITA KU, 5-21-1 OJI/TOKYO 114//JAPAN/ (REPRINT); NIPPON PAPER IND CO LTD,CENT RES LAB, KITA KU/TOKYO 114//JAPAN/
Journal: PLANT CELL REPORTS, **1999**, V18, N11 (AUG), P941-947
ISSN: 0721-7714 Publication date: 19990800
Publisher: SPRINGER VERLAG, 175 FIFTH AVE, NEW YORK, NY 10010
Language: English Document Type: ARTICLE
Abstract: In a previous report, a novel selection protocol termed ''the MAT-vector system'' for generating marker-free transgenic plants (MFTPs) was presented. The first stage of the system is visual selection of morphologically abnormal transgenic shoots, **ipt** -shooty, that have lost apical dominance and rooting ability. The second stage involves elimination of the **ipt** gene and the appearance of MFTPs free of **ipt** gene influence. The present report describes a practical MAT-vector in which removal of the **ipt** gene is efficiently mediated by the site-specific

recombination system R/RS from Zygosaccharomyces rouxii, in place of the maize transposable element Ac, used previously. This improved MAT-vector produced MFTPs from 39% of moderate **ipt**-shooty and 70% of extreme **ipt**-shooty lines. These results are superior to the previous MAT-vector which produced MFTPs from only 5% of **ipt** -shooty lines. The present novel system also induced direct development of MFTPs from adventitious buds without production of **ipt**-shooty intermediates. The presence of beta-glucuronidase (GUS) and neomycin phosphotransferase (NPTII) genes of interest, and the absence of the **ipt** gene were verified by a GUS histochemical assay, NPTII assay, and molecular analysis.

5/3,AB/49 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

07302954 Genuine Article#: 147XB Number of References: 11
Title: Rice **transformation** with a senescence-inhibition chimeric gene (ABSTRACT AVAILABLE)
Author(s): Fu YC; Ding YY; Liu XF; Sun CQ; Cao SY; Wang DJ; He SJ; Wang XK; Li LC; Tian WZ (REPRINT)
Corporate Source: CHINESE ACAD SCI,GENET INST/BEIJING 100101//PEOPLES R CHINA/ (REPRINT); CHINESE ACAD SCI,GENET INST/BEIJING 100101//PEOPLES R CHINA/; CHINA AGR UNIV,/BEIJING 100094//PEOPLES R CHINA/
Journal: CHINESE SCIENCE BULLETIN, **1998**, V43, N21 (NOV), P1810-1815
ISSN: 1001-6538 Publication date: 19981100
Publisher: SCIENCE CHINA PRESS, 16 DONGHUANGCHENGGEN NORTH ST, BEIJING 100717, PEOPLES R CHINA
Language: English Document Type: ARTICLE
Abstract: A senescence-inhibition chimeric gene containing the specific promoter of SAG(12) and **IPT** gene was transferred into rice with the biolistic method. Results of PCR, Dot blotting and Southern blotting indicated that the chimeric gene had been integrated into rice genome. Analyses of GUS activity and cytokinin content in transgenic plants of rice and the observation of T-1 generation plant at grain formation stage indicated that the foreign gene was **expressed**.

5/3,AB/50 (Item 3 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

07048099 Genuine Article#: 118EM Number of References: 48
Title: **Expression** of the yeast mevalonate kinase gene in trangenic tobacco (ABSTRACT AVAILABLE)
Author(s): Champenoy S; Tourte M (REPRINT)
Corporate Source: IBMIG,UPRES 1221, LAB BIOL CELLULAIRE VEGETALE, 40 AVE RECTEUR PINEAU/F-86022 POITIERS//FRANCE/ (REPRINT); IBMIG,UPRES 1221, LAB BIOL CELLULAIRE VEGETALE/F-86022 POITIERS//FRANCE/
Journal: MOLECULAR BREEDING, **1998**, V4, N4, P291-300
ISSN: 1380-3743 Publication date: 19980000
Publisher: KLUWER ACADEMIC PUBL, SPUIBOULEVARD 50, PO BOX 17, 3300 AA DORDRECHT, NETHERLANDS
Language: English Document Type: ARTICLE
Abstract: The coding region of the yeast mevalonate kinase gene (ERG12), under the control of the cauliflower mosaic virus (CaMV) 35S promoter, has been inserted in tobacco (Nicotiana tabacum cv. Paraguay Bell) using an Agrobacterium tumefaciens binary vector system. Ìntegration and **expression** of the ERG12 chimaeric gene was demonstrated in several independent **transformants** in which specific mevalonate kinase (MK) activity in young plantlets was increased by about 60% on average. The **expression** of this MK gene was accompanied by phenotypical modifications, such as acceleration of regenerating

processes, lateral bud growth, and peculiar flowering behaviour. A higher chlorophyll content all along the plant development, paralleled by an unusual starch accumulation in the leaves of young plantlets and, later, in roots of full-grown plants, was also detected. Overexpression of the MK gene led also to a stronger inhibition of cytokinin-induced plant growth by methyl jasmonate in transgenic plants. All these events may be interpreted as a possible modification of the hormonal balance in transgenic tobaccos.

5/3,AB/51 (Item 4 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

06611933 Genuine Article#: ZE419 Number of References: 34
Title: Phenotypic alterations and component analysis of seed yield in transgenic Brassica napus plants **expressing** the tzs gene (ABSTRACT AVAILABLE)
Author(s): Roeckel P (REPRINT) ; Oancia T; Drevet JR
Corporate Source: UNIV CLERMONT FERRAND,INRA, LAB ORG & VARIABIL GENOMES VEGETAUX, 24 AVE LANDAIS/F-63177 CLERMONT FERRAND//FRANCE/ (REPRINT); UNIV CALGARY,DEPT BIOL SCI/CALGARY/AB T2N 1N4/CANADA/; UNIV CLERMONT FERRAND,BIOL CELLULAIRE LAB, CNRS, URA 6547 GEEM/F-63177 CLERMONT FERRAND//FRANCE/
Journal: PHYSIOLOGIA PLANTARUM, **1998**, V102, N2 (FEB), P243-249
ISSN: 0031-9317 Publication date: 19980200
Publisher: MUNKSGAARD INT PUBL LTD, 35 NORRE SOGADE, PO BOX 2148, DK-1016 COPENHAGEN, DENMARK
Language: English Document Type: ARTICLE
Abstract: Cytokinins play an important role in plant development. We investigated the possibility that the nopaline Ti plasmid gene (tzs) from Agrobacterium tumefaciens could encode a protein able to participate in plant cytokinin production and lead to alterations in plant phenotype as a result of the **expression** of endogenous tzs. tzs was placed under the control of a heat-inducible promoter from the Zea mays hsp 70 gene. The **expression** of this fused gene was examined in transgenic Brassica napus plants. The tzs gene, which encodes the enzyme dimethylallyl transferase, was used as a cytokinin biosynthetic gene. The **expression** of the tzs gene was monitored by RNA hybridization and analysis of cytokinin. content. Overproduction of cytokinin was observed even when the plants had not been heat-shocked, and the plants displayed a reduced root system, increased height and branching, and delayed flowering. In addition, a significant increase in seed yield was observed in the transgenic plants, accounted for by increased number of seeds per silique and seed weight. The results suggest that increased levels of cytokinins, through the **expression** of tzs, are correlated with growth rather than with differentiation processes.

5/3,AB/52 (Item 5 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

06177862 Genuine Article#: YA111 Number of References: 35
Title: Increased content of endogenous cytokinins does riot delay degradation of photosynthetic apparatus in tobacco (ABSTRACT AVAILABLE)
Author(s): Synkova H (REPRINT) ; VanLoven K; Valcke R
Corporate Source: ACAD SCI CZECH REPUBL,INST EXPT BOT, KARLOVCE 1A/CZ-16000 PRAGUE 6//CZECH REPUBLIC/ (REPRINT); LIMBURGS UNIV CTR,DEPT SBG/B-3590 DIEPENBEEK//BELGIUM/
Journal: PHOTOSYNTHETICA, **1997**, V33, N3-4, P595-608
ISSN: 0300-3604 Publication date: 19970000

Publisher: INST EXPERIMENTAL BOTANY, ACAD SCI CZECH REPUBLIC, NA KARLOVCE 1A, PRAGUE 6, CZECH REPUBLIC CS-160 00
Language: English Document Type: ARTICLE
Abstract: The effect of stress (long-term darkening) on the structure and functioning of the photosynthetic apparatus was studied in leaves of non-**transformed** as well as two types of **ipt-transformed** tobacco (Nicotiana tabacum cv. Petit Havana SR1) plants, The **ipt**-gene controlling the biosynthesis of cytokinins (CKs) was coupled to the light-inducible Pssu-promoter of Pisum sativum of to the heat-inducible hsp-promoter of Drosophila melanogaster. Pssu-**ipt** transgenic grafts with high contents of endogenous CKs retained their chlorophyll (Chi) content during a 15 d dark treatment while the SR1- and heat-treated Phsp 70-**ipt** seedlings, which did not differ significantly in CKs content, lost up to 60 % of their Chi. The normalised variable fluorescence ratio (F-v/F-m) and oxygen evolution decreased dramatically in the course of continuous dark treatment, indicating a degradation of photosystem. 2 irrespective of the plant type. Changes in the polypeptide composition of thylakoid membranes, as analysed by SDS-PAGE, confirmed this degradation process. Light and electron microscopic observations of leaf sections, and of the ultrastructure of plastids showed changes corresponding to a degradation of the photosynthetic apparatus.

5/3,AB/53 (Item 6 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

06112034 Genuine Article#: XV738 Number of References: 122
Title: The impact of Ti-plasmid-derived gene vectors on the study of the mechanism of action of phytohormones (ABSTRACT AVAILABLE)
Author(s): Walden R (REPRINT) ; Reiss B; Koncz C; Schell J
Corporate Source: MAX PLANCK INST ZUCHTUNGSFORSCH,CARL VON LINNE WEG 10/D-50829 COLOGNE//GERMANY/ (REPRINT)
Journal: ANNUAL REVIEW OF PHYTOPATHOLOGY, **1997**, V35, P45-66
ISSN: 0066-4286 Publication date: 19970000
Publisher: ANNUAL REVIEWS INC, 4139 EL CAMINO WAY, PO BOX 10139, PALO ALTO, CA 94303-0139
Language: English Document Type: REVIEW
Abstract: The molecular basis of tumor formation on dicotyledonous plants by Agrobacterium relies on the transfer to the plant cell of a unique segment of bacterial DNA, the T-DNA. The T-DNA contains genes that are active in the plant cell and encode hormone biosynthetic enzymes, or proteins that deregulate the cell's response to phytohormones. Study of this process has yielded not only knowledge of how alterations in phytohormone homeostasis can affect plant cell growth, but also has provided the essential tools to study phytohormone signaling in transgenic plants. Furthermore, T-DNA insertion into the plant genome forms the basis of gene tagging, a versatile method for isolating genes involved in phytohormone signal transduction and action.

5/3,AB/54 (Item 7 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

06031915 Genuine Article#: XQ731 Number of References: 31
Title: Changes of both polypeptide pattern and sensitivity to cytokinin following **transformation** of periwinkle tissues with the **isopentenyl transferase** gene (ABSTRACT AVAILABLE)
Author(s): Carpin S; Garnier F; Andreu F; Chenieux JC; Rideau M (REPRINT) ; Hamdi S
Corporate Source: UNIV TOURS,LAB BIOL VEGETALE & BIOCHIM CELLULAIRE, EA 2106, 31 AVE MONGE/F-37200 TOURS//FRANCE/ (REPRINT); UNIV TOURS,LAB

BIOL VEGETALE & BIOCHIM CELLULAIRE, EA 2106/F-37200 TOURS//FRANCE/
Journal: PLANT PHYSIOLOGY AND BIOCHEMISTRY, **1997**, V35, N8 (AUG), P 603-609
ISSN: 0981-9428 Publication date: 19970800
Publisher: GAUTHIER-VILLARS, 120 BLVD SAINT-GERMAIN, 75280 PARIS CEDEX 06, FRANCE
Language: English Document Type: ARTICLE
Abstract: Two-dimensional gel electrophoresis was used to examine differences between the polypeptide patterns of an untransformed periwinkle callus line and a **transformed** line carrying the cytokinin biosynthesis gene **isopentenyl transferase** (**ipt**) under control of a light-inducible promoter. Both lines were cultured for three weeks on an auxin free medium with or without exogenously-added zeatin, in continuous light or in complete darkness. Firstly, it was found that exogenous cytokinin treatment increased the amount of at least 24 polypeptides and decreased the amount of three polypeptides in the untransformed line. Secondly, a marked decrease in the number and the amount of the polypeptides was observed in the 2D-gels from the transgenic line. Traces of two cytokinin up-regulated polypeptides, the amounts of which have been previously found to be correlated with the accumulation of indole alkaloids in periwinkle cells in vitro were present in this line. Lastly, exogenous cytokinin treatment had very little effect on the polypeptide pattern of the transgenic line. These data show that endogenously-produced cytokinin does not mimic the effect of exogenously-applied cytokinin on the polypeptide accumulation in periwinkle callus cultures, and that the **ipt**-transgenic line has become insensitive to exogenous cytokinin treatment.

5/3,AB/55 (Item 8 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05867710 Genuine Article#: XD243 Number of References: 50
Title: Tobacco plants carrying a tms locus of Ti-plasmid origin and the Hl-1 allele are tumor prone (ABSTRACT AVAILABLE)
Author(s): Meyer AD; Aebi R; Meins F (REPRINT)
Corporate Source: FRIEDRICH MIESCHER INST,BOX 2543/CH-4002 BASEL//SWITZERLAND/ (REPRINT); FRIEDRICH MIESCHER INST,/CH-4002 BASEL//SWITZERLAND/
Journal: DIFFERENTIATION, **1997**, V61, N4 (MAY), P213-221
ISSN: 0301-4681 Publication date: 19970500
Publisher: SPRINGER VERLAG, 175 FIFTH AVE, NEW YORK, NY 10010
Language: English Document Type: ARTICLE
Abstract: The autonomous growth of plant tumor cells is believed to result from their persistent loss of the requirement for growth hormones such as auxin and cytokinin. The partially dominant gene Habituated leaf-1 (HI-1) regulates the requirement of cultures tissues of Havana 425 tobacco (Nicotiana tabacum L.) for cytokinins. The HI-1 allele can partially restore the tumor phenotype in tobacco cells **transformed** with a Agrobacterium tumefaciens Ti plasmid defective in the **isopentenyl transferase** locus, which encodes a key enzyme in cytokinin biosynthesis and is required for neoplastic growth. To investigate the oncogenic function of HI-1, we **transformed** wild-type (hl-1/hl-1) and Hl-1/Hl-1 tobacco plants with the tms locus derived from the limited-host-range Ti plasmid pTiAg162. This locus encodes enzymes for biosynthesis of the auxin indole-3-acetic acid. Grafting tests and measurements of the hormone requirement of cultured explants show that wound-induced overgrowths arising in tms **transformed** Hl-1 plants are tumorous. While some wound-induced overgrowths also formed in hl-1/hl-1 **transformants**, these showed slight hormone-autotrophic growth and weak tumorigenicity in grafting tests, In addition, Hl-1/Hl-1 tms/tms plants, but not hl-1/hl-1 tms/tms

plants, spontaneously developed rooty teratomatous overgrowths, showed flowering abnormalities, and formed calli at the base of the stem in young seedlings. Thus, Hl-1 tms plants exhibit a tumor-prone phenotype, and in this regard closely resemble tumor-prone hybrids that arise in certain interspecific crosses of Nicotiana species. Our results show that the interaction of just two genetic elements - the mutant Hl-1 allele of the tobacco host with tms genes of Ti plasmid origin - are sufficient for a tumor-prone phenotype.

5/3,AB/56 (Item 9 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05754079 Genuine Article#: WV255 Number of References: 36
Title: Growth pattern, tuber formation and hormonal balance in in vitro potato plants carrying **ipt** gene (ABSTRACT AVAILABLE)
Author(s): Ivana M (REPRINT) ; Lidiya S; Milos O; Oksana Z; Tatyana K; Josef S; Jaroslava O; Svetlana G; Yurii R; Nina A
Corporate Source: ACAD SCI CZECH REPUBL,DE MONTFORT UNIV, NORMAN BORLAUG INST PLANT SCI, INST EXPT BOT, KE DVORU 15/PRAGUE 16600 6//CZECH REPUBLIC/ (REPRINT); RUSSIAN ACAD SCI,INST PLANT PHYSIOL/MOSCOW 127236//RUSSIA/; ACAD SCI CZECH REPUBL,INST PLANT MOL BIOL/CESKE BUDEJOVICE 38000//CZECH REPUBLIC/; INST CROP PROD,/PRAGUE 16106 6//CZECH REPUBLIC/
Journal: PLANT GROWTH REGULATION, **1997**, V21, N1 (JAN), P27-36
ISSN: 0167-6903 Publication date: 19970100
Publisher: KLUWER ACADEMIC PUBL, SPUIBOULEVARD 50, PO BOX 17, 3300 AA DORDRECHT, NETHERLANDS
Language: English Document Type: ARTICLE
Abstract: Nodal cuttings of in vitro grown potato plants (Solanum tuberosum, cv. Miranda) were **transformed** by a vector plasmid carrying **ipt** gene of Agrobacterium tumefaciens, From the initial teratoma stage 5 clones of transgenic plants (1, 2, 11, 13 and 15) were obtained, which displayed in varying degree shortening of the internodes, decrease of the leaf size, decrease of apical dominance and poor rooting. In addition, two of the clones (11 and 13) showed increased stolen and tuber formation. In all these clones the endogenous level of free cytokinins (CKs) was increased: from 40% in clone 11 to almost 300% in clone 1. Also free indole-3-acetic acid (IAA) level was increased, but to a lower degree; the maximal increase was 160% (clone 13), Applied kinetin or IAA (1 mg.l(-1)) strongly suppressed root and tuber formation in clones 11 and 13, although they did not affect or even stimulated these processes in control plants. For control plants the minimal medium sucrose concentration necessary for tuber initiation was 6% whereas in clone 1 1 plants 2% was sufficient. Different distribution of endogenous CKs and IAA was observed in clone 11 and control plants. The highest CK content was found in transgenic plants in stems and in controls in leaves. In clone 11 plants abscisic acid (ABA) level was significantly increased in comparison to the control throughout the cultivation period. Ethylene formation was strongly increased the first week after the subcultivation and later on the difference between transgenic and control plants rapidly diminished. Reactions of clone 11 plants to red (RL) and blue light (BL) were similar to reactions of control plants. In RL clone 11 plants were tall and thin with stunted leaves; in BL they had a teratoma-like appearance and formed a very high number of tubers. The role of hormones in these changes in growth and tuber formation is discussed.

5/3,AB/57 (Item 10 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05669711 Genuine Article#: WP334 Number of References: 36
Title: Selection of marker-free transgenic plants using the **isopentenyl transferase** gene (ABSTRACT AVAILABLE)
Author(s): Ebinuma H (REPRINT) ; Sugita K; Matsunaga E; Yamakado M
Corporate Source: NIPPON PAPER IND CO LTD,CENT RES LAB, KITA KU, 5-21-1 OJI/TOKYO 114//JAPAN/ (REPRINT)
Journal: PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, **1997**, V94, N6 (MAR 18), P2117-2121
ISSN: 0027-8424 Publication date: 19970318
Publisher: NATL ACAD SCIENCES, 2101 CONSTITUTION AVE NW, WASHINGTON, DC 20418
Language: English Document Type: ARTICLE
Abstract: We have developed a new plant vector system for repeated **transformation** (called MAT for multi-auto-**transformation**) in which a chimeric **ipt** gene, inserted into the transposable element Ac, is used as a selectable marker for **transformation**, Selectable marker genes conferring antibiotic or herbicide resistance, used to introduce economically valuable genes into crop plants, have three major problems: (i) the selective agents have negative effects on proliferation and differentiation of plant cells; (ii) there is uncertainty regarding the environmental impact of many selectable marker genes; (iii) it is difficult to perform recurrent **transformations** using the same selectable marker to pyramid desirable genes, The MAT vector system containing the **ipt** gene and the Ac element is designed to overcome these difficulties, When tobacco leaf segments were **transformed** and selected, subsequent excision of the modified Ac produced marker-free transgenic tobacco plants without sexual crosses or seed production, In addition, the chimeric **ipt** gene could be visually used as a selectable marker for **transformation** of hybrid aspen (Populus sieboldii x Populus grandidentata). The chimeric **ipt** gene, therefore, is an attractive alternative to the most widely used selectable marker genes. The MAT vector system provides a promising way to shorten breeding time for genetically engineered crops, This method could be particularly valuable for fruit and forest trees, for which long generation times are a more significant barrier to breeding and genetic analysis.

5/3,AB/58 (Item 11 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05509470 Genuine Article#: WD233 Number of References: 21
Title: Morphogenetic manifestations of the **expression** of the bacterial **ipt** gene in regenerated tobacco plants in vitro (ABSTRACT AVAILABLE)
Author(s): Makarova RV (REPRINT) ; Andrianov VM; Borisova TA; Piruzyan ES; Kefeli VI
Corporate Source: RUSSIAN ACAD SCI,KA TIMIRYAZEV PLANT PHYSIOL INST, UL BOTANICHESKAYA 35/MOSCOW 127276//RUSSIA/ (REPRINT); RUSSIAN ACAD SCI,INST MOL GENET/MOSCOW//RUSSIA/
Journal: RUSSIAN JOURNAL OF PLANT PHYSIOLOGY, **1997**, V44, N1 (JAN-FEB), P6-13
ISSN: 1021-4437 Publication date: 19970100
Publisher: MAIK NAUKA/INTERPERIODICA, C/O PLENUM/CONSULTANTS BUREAU 233 SPRING ST, NEW YORK, NY 10013
Language: English Document Type: ARTICLE
Abstract: The capacities for regeneration, callus formation, and organogenesis were studied in tobacco (Nicotiana tabacum L.) plants, both wild-type and **transformed** with the active **ipt** gene of agrobacterium Transgenic plants carrying the **ipt** gene were capable of forming calli only on medium supplemented with2,4-D and kinetin. However, further callus growth did not depend on phytohormone

presence. The regenerated transgenic plants had short stems with numerous leaves; their roots were initiated three-five days earlier than in the wildtype regenerated plants. Morphological traits of **transformed** regenerants are probably conditioned by their specific hormonal system.

5/3,AB/59 (Item 12 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

04993818 Genuine Article#: UX896 Number of References: 57
Title: CHEMICALLY-INDUCED **EXPRESSION** OF THE ROLC-ENCODED BETA-GLUCOSIDASE IN TRANSGENIC TOBACCO PLANTS AND ANALYSIS OF CYTOKININ METABOLISM - ROLC DOES NOT HYDROLYZE ENDOGENOUS CYTOKININ GLUCOSIDES IN PLANTA (Abstract Available)
Author(s): FAISS M; STRNAD M; REDIG P; DOLEZAL K; HANUS J; VANONCKELEN H; SCHMULLING T
Corporate Source: UNIV TUBINGEN,LEHRSTUHL ALLGEMEINE GENET,MORGENSTELLE 28/D-72076 TUBINGEN//GERMANY/; UNIV TUBINGEN,LEHRSTUHL ALLGEMEINE GENET/D-72076 TUBINGEN//GERMANY/; INST EXPT BOT,DEPT PLANT BIOTECHNOL/CZ-77200 OLOMOUC//CZECH REPUBLIC/; UNIV ANTWERP,DEPT BIOL/B-2610 ANTWERP//BELGIUM/; INST EXPT BOT,ISOTOPE LAB/CZ-14220 PRAGUE//CZECH REPUBLIC/
Journal: PLANT JOURNAL, **1996**, V10, N1 (JUL), P33-46
ISSN: 0960-7412
Language: ENGLISH Document Type: ARTICLE
Abstract: The rolC gene of Agrobacterium rhizogenes T-DNA plays an essential role in the establishment of hairy root disease and its overexpression in transgenic plants causes pleiotropic developmental alterations, This study investigated whether the biological activity of the rolC beta-glucosidase is due to an alteration of the cytokinin balance in planta, HPLC radiocounting assays of [H-3]-labeled cytokinin glucosides fed exogenously to tobacco leaf disks, to rolC **expressing** Escherichia coil cells or cell-free extracts showed that cytokinin N3- and O-glucosides are the preferred substrate of the rolC protein. Hydrolysis of N7- and NS-glucosides was not detected at substrate concentrations close to physiological levels. Furthermore, these conjugates were also not active as cytokinins in biotests when fed to rolC-**expressing** tissues. For analysis of the rolC activity on endogenous cytokinin conjugates the gene was **expressed** under the transcriptional control of a modified tetracycline-inducible 35S promoter, This was done to avoid possible interference with secondary effects or plant homeostatic mechanisms which could mask primary in planta events when transgenes are **expressed** constitutively. No changes in the endogenous pool of different cytokinin glucosides, as determined by a newly developed electrospray tandem mass spectroscopy directly coupled to high performance liquid chromatography, were found following chemical induction of the rolC gene. Also the levels of free cytokinins remained unchanged after gene induction, Hybrid tobacco plants **expressing** the cytokinin-synthezising **ipt** gene and the rolC gene showed added phenotypes indicating that the rolC phenotype is mediated on a signalling pathway different from those of cytokinins, RolC/**ipt** hybrids also accumulated high levels of cytokinin O-glucosides. It is concluded that the phenotypic alterations caused by the rolC gene product are not due to a release of free cytokinins from inactive conjugates, most likely because of subcellular compartmentation of the putative substrate.

5/3,AB/60 (Item 13 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

04549569 Genuine Article#: TR821 Number of References: 10
Title: TISSUE-CULTURE AND **TRANSFORMATION** OF OENOTHERA-BIENNIS (Abstract Available)
Author(s): PAVINGEROVA D; GALIS I; ONDREJ M
Corporate Source: ACAD SCI CZECH REPUBL,INST PLANT MOLEC BIOL,BRANISOVSKA 31/CR-37005 CESKE BUDEJOVICE//CZECH REPUBLIC/
Journal: BIOLOGIA PLANTARUM, **1996**, V38, N1, P27-32
ISSN: 0006-3134
Language: ENGLISH Document Type: ARTICLE
Abstract: Five cultivars of Oenothera biennis have been tested for callogenesis and organogenesis on different media. The cultivar CV3 has been **transformed** by Agrobacterium tumefaciens strain which introduces into the plant genome kanamycin resistance gene and the T-DNA **ipt** gene which causes increased levels of cytokinins. **Transformed** tissues showed elevated levels of cytokinins and grew as teratomas forming clumps of short, branched shoots with small modified leaves. Roots appeared rarely in later subcultivations of some teratomous clones.

5/3,AB/61 (Item 14 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

04529283 Genuine Article#: TL420 Number of References: 14
Title: INHIBITION OF LEAF SENESCENCE BY AUTOREGULATED PRODUCTION OF CYTOKININ (Abstract Available)
Author(s): GAN SS; AMASINO RM
Corporate Source: UNIV WISCONSIN,DEPT BIOCHEM,420 HENRY MALL/MADISON//WI/53706; UNIV WISCONSIN,DEPT BIOCHEM/MADISON//WI/53706
Journal: SCIENCE, **1995**, V270, N5244 (DEC 22), P1986-1988
ISSN: 0036-8075
Language: ENGLISH Document Type: ARTICLE
Abstract: Controlling **expression** of **IPT**, a gene encoding **isopentenyl transferase** (the enzyme that catalyzes the rate-limiting step in cytokinin biosynthesis), with a senescence-specific promoter results in the suppression of leaf senescence. Transgenic tobacco plants **expressing** this chimeric gene do not exhibit the developmental abnormalities usually associated with **IPT expression** because the system is autoregulatory. Because sufficient cytokinin is produced to retard senescence, the activity of the senescence-specific promoter is attenuated. Senescence-retarded leaves exhibit a prolonged, photosynthetically active life-span. This result demonstrates that endogenously produced cytokinin can regulate senescence and provides a system to specifically manipulate the senescence program.

5/3,AB/62 (Item 15 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

04482464 Genuine Article#: TG238 Number of References: 27
Title: THE EFFECT OF AN ELEVATED CYTOKININ LEVEL USING THE **IPT** GENE AND N-6-BENZYLADENINE ON SINGLE NODE AND INTACT POTATO PLANT TUBERIZATION IN-VITRO (Abstract Available)
Author(s): GALIS I; MACAS J; VLASAK J; ONDREJ M; VANONCKELEN HA
Corporate Source: ACAD SCI CZECH REPUBL,INST PLANT MOLEC BIOL,BRANISOVSKA 31/CR-37005 CESKE BUDEJOVICE//CZECH REPUBLIC/; UNIV INSTELLING ANTWERP,DEPT BIOL/B-2610 WILRIJK//BELGIUM/
Journal: JOURNAL OF PLANT GROWTH REGULATION, **1995**, V14, N3 (SUM), P 143-150
ISSN: 0721-7595
Language: ENGLISH Document Type: ARTICLE

Abstract: Two models of potato (Solanum tuberosum L.) tuberization in vitro (intact plants and single nodes) were used to study the role of cytokinins in this process. We applied hormone in two different ways. The exogenous addition of 10 mg . L(-1) N-6-benzyladenine (BA) into the tuberization medium resulted in advanced tuber formation in intact plants, and microtubers appeared 10-20 days earlier than in the experiments in which no cytokinin was supplied. **Transformation** with the Agrobacterium tumefaciens **ipt** gene provided potato clones with endogenously elevated cytokinin levels (3-20 times higher zeatin riboside content in different clones). The onset of tuberization in intact **ipt-transformed** plants with low transgene **expression** was advanced in comparison with control material, and exogenously applied BA further promoted the tuberization process. On the contrary, tuberization was strongly inhibited in **ipt-transformed** nodes, and an external increase of the cytokinin level caused complete inhibition of explant growth. In untransformed (control) nodes cytokinin application resulted in primary and secondary tuber formation, which depended on the BA concentration in cultivation media.

5/3,AB/63 (Item 16 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

04063783 Genuine Article#: RB577 Number of References: 27
Title: CYTOKININ INVOLVEMENT IN THE CONTROL OF COUMARIN ACCUMULATION IN NICOTIANA-TABACUM - INVESTIGATIONS WITH NORMAL AND **TRANSFORMED** TISSUES CARRYING THE ISOPENTYL TRANSFERASE GENE (Abstract Available)
Author(s): HAMDI S; CRECHE J; GARNIER F; MARS M; DECENDIT A; GASPAR T; RIDEAU M
Corporate Source: FAC PHARM TOURS,BIOL CELLULAIRE & BIOCHIM VEGETALE LAB,EA 1370/F-37200 TOURS//FRANCE/; FAC PHARM TOURS,BIOL CELLULAIRE & BIOCHIM VEGETALE LAB/F-37200 TOURS//FRANCE/; INRST,UNITE BIOL/HAMMAM LIF 2050//TUNISIA/; INST BOT,HORMONOL VEGETALE LAB/B-4000 LIEGE//BELGIUM/
Journal: PLANT PHYSIOLOGY AND BIOCHEMISTRY, **1995**, V33, N3 (MAY-JUN) , P283-288
ISSN: 0981-9428
Language: ENGLISH Document Type: ARTICLE
Abstract: The effects of cytokinins on accumulation of the coumarin scopolin in tobacco tissues were investigated. Leaf discs were **transformed** with the Agrobacterium tumefaciens **ipt**-gene under control of either its native promoter or a light-inducible promoter: several shoot cultures were isolated, from which **ipt** -transgenic callus cultures were initiated. Leaves from all the **ipt**-transgenic shoot cultures (grown in light) accumulated high level of scopolin, whereas control (untransformed) leaves did not. Callus cultures carrying the **ipt**-gene under control of its own promoter accumulated higher contents of scopolin as compared with untransformed calli, irrespective of light or dark condition. Dark-grown callus cultures carrying the **ipt** gene under control of the light-inducible promoter accumulated scopolin at comparable amounts that did untransformed calli; transferring the transgenic calli from dark to light, or adding a cytokinin to the culture medium resulted in an increase of the scopolin content. Exogenously applied cytokinin also increased the scopolin content of untransformed callus cultures. These data show that cytokinins control coumarin accumulation, and that enhanced levels of endogenous cytokinins could mimic the effect of exogenous cytokinins on coumarin pathway in tobacco tissues.

5/3,AB/64 (Item 17 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

03150931 Genuine Article#: NJ081 Number of References: 45
Title: THE FAS OPERON OF RHODOCOCCUS FASCIANS ENCODES NEW GENES REQUIRED FOR EFFICIENT FASCIATION OF HOST PLANTS (Abstract Available)
Author(s): CRESPI M; VEREECKE D; TEMMERMAN W; VANMONTAGU M; DESOMER J
Corporate Source: STATE UNIV GHENT,GENET LAB,KL LEDEGANCKSTR 35/B-9000 GHENT//BELGIUM/; STATE UNIV GHENT,GENET LAB/B-9000 GHENT//BELGIUM/
Journal: JOURNAL OF BACTERIOLOGY, **1994**, V176, N9 (MAY), P2492-2501
ISSN: 0021-9193
Language: ENGLISH Document Type: ARTICLE
Abstract: Three virulence loci (fas, aft, and hgp) of Rhodococcus fascians D188 have been identified on a 200-kb conjugative linear plasmid (pFiD188). The fns locus was delimited to a 6.5-kb DNA fragment by insertion mutagenesis, single homologous disruptive recombination, and in trans complementation of different avirulent insertion mutants. The locus is arranged as a large operon containing six open reading frames whose **expression** is specifically induced during the interaction with host plants. One predicted protein is homologous to P-450 cytochromes from actinomycetes. The putative ferredoxin component is of a novel type containing additional domains homologous to transketolases from chemoautotrophic, photosynthetic, and methylotrophic microorganisms. Genetic analysis revealed that fas encodes, in addition to the previously identified **ipt**, at least two new genes that are involved in fasciation development, one of which is only required on older tobacco plants.

5/3,AB/65 (Item 18 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

02791814 Genuine Article#: MD517 Number of References: 37
Title: CYTOKININ-MEDIATED INSECT RESISTANCE IN NICOTIANA PLANTS TRANSFORMED WITH THE **IPT** GENE (Abstract Available)
Author(s): SMIGOCKI A; NEAL JW; MCCANNA I; DOUGLASS L
Corporate Source: USDA ARS,BELTSVILLE AGR RES CTR,PLANT MOLEC BIOL LAB/BELTSVILLE//MD/20705; USDA ARS,BELTSVILLE AGR RES CTR,FLORIST & NURSERY CROPS LAB/BELTSVILLE//MD/20705; UNIV MARYLAND,DEPT ANIM SCI/COLL PK//MD/20742
Journal: PLANT MOLECULAR BIOLOGY, **1993**, V23, N2 (OCT), P325-335
ISSN: 0167-4412
Language: ENGLISH Document Type: ARTICLE
Abstract: The bacterial **isopentenyl transferase** (**ipt**) gene involved in cytokinin biosynthesis was fused with a promoter from the proteinase inhibitor II (PI-IIK) gene and introduced into Nicotiana plumbaginifolia. Transcripts of the **ipt** gene were wound-inducible in leaves of transgenic PI-II-**ipt** plants. In leaf disks excised from fully expanded leaves, transcript levels increased 25- to 35-fold within 24 h and by 48 h were reduced by about 50%. In flowering plants, message levels were 2- to 5-fold higher than in preflowering plants. These plants were used to test for defensive properties of cytokinins against insects. Manduca sexta larvae consumed up to 70% less of the PI-II-**ipt** leaf material on flowering plants than larvae feeding on controls. Normal development of Myzus persicae nymphs was also delayed. Approximately half as many nymphs reached adulthood on PI-II-**ipt** leaves than on controls. Zeatin and zeatinriboside levels in leaves remaining on PI-II-**ipt** plants after hornworm feeding were elevated by about 70-fold and the chlorophyll a/b content was double that of controls. Exogenous applications of zeatin to the PI-II-**ipt** leaves enhanced the level of resistance to the tobacco hornworm and almost completely inhibited normal development of the green peach aphid nymphs. Transcript levels of an acidic chitinase gene were low and minimally inducible in PI-II-**ipt** leaves. The mode of action of the cytokinin gene product on enhanced insect resistance is

not clear but may involve the products of secondary metabolic pathways.

5/3,AB/66 (Item 19 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

02665429 Genuine Article#: LU536 Number of References: 35
Title: PRODUCTION OF MULTIPLE GROWTH-FACTORS BY A HUMAN NONSMALL CELL LUNG-CARCINOMA CELL-LINE (Abstract Available)
Author(s): OCCLESTON NL; WALKER C
Corporate Source: CLATTERBRIDGE HOSP,JK DOUGLAS CANC RES LABS,CLATTERBRIDGE CANC RES TRUST/BEBINGTON L63 4JY//ENGLAND/; CLATTERBRIDGE HOSP,JK DOUGLAS CANC RES LABS,CLATTERBRIDGE CANC RES TRUST/BEBINGTON L63 4JY//ENGLAND/
Journal: CANCER LETTERS, **1993**, V71, N1-3 (JUL 30), P203-210
ISSN: 0304-3835
Language: ENGLISH Document Type: ARTICLE
Abstract: The **IPT** cell line, derived from an undifferentiated bronchial carcinoma, produced, in conditioned medium, immunoreactive basic fibroblast growth factor (bFGF), insulin-like growth factors I and II (IGF-I and IGF-II), epidermal growth factor (EGF), **transforming** growth factor alpha (TGFalpha), and **transforming** growth factor beta-2 (TGFbeta2) in its latent form, but not platelet-derived growth factor (PDGF), tumour necrosis factor alpha (TNFalpha), or **transforming** growth factor beta-1 (TGFbeta1). Comparative studies of growth stimulation of human umbilical vein (HUV) endothelial cells indicated that the growth factors detected in 1PT-conditioned medium do not solely account for its proliferative effects on these cells. These results support previous characterization studies [1,2] that suggest the production of a potentially novel tumour-derived endothelial cell growth factor by the 1PT cell line.

5/3,AB/67 (Item 20 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

02507635 Genuine Article#: LG170 Number of References: 54
Title: HORMONAL CHARACTERIZATION OF TRANSGENIC TOBACCO PLANTS **EXPRESSING** THE ROLC GENE OF AGROBACTERIUM-RHIZOGENES TL-DNA (Abstract Available)
Author(s): NILSSON O; MORITZ T; IMBAULT N; SANDBERG G; OLSSON O
Corporate Source: SWEDISH UNIV AGR SCI,DEPT FOREST GENET & PLANT PHYSIOL/S-90183 UMEA//SWEDEN/; SWEDISH UNIV AGR SCI,DEPT FOREST GENET & PLANT PHYSIOL/S-90183 UMEA//SWEDEN/; UMEA UNIV,DEPT PLANT PHYSIOL/S-90187 UMEA//SWEDEN/
Journal: PLANT PHYSIOLOGY, **1993**, V102, N2 (JUN), P363-371
ISSN: 0032-0889
Language: ENGLISH Document Type: ARTICLE
Abstract: Transgenic tobacco (Nicotiana tabacum L. cv Wisconsin 38) plants **expressing** the Agrobacterium rhizogenes rolC gene under the control of the cauliflower mosaic virus 35S RNA promoter were constructed. These plants displayed several morphological alterations reminiscent of changes in indole-3-acetic acid (IAA), cytokinin, and gibberellin (GA) content. However, investigations showed that neither the IAA pool size nor its rate of turnover were altered significantly in the rolC plants. The biggest difference between rolC and wild-type plants was in the concentrations of the cytokinin, isopentenyladenosine (iPA) and the gibberellin GA19. Radioimmunoassay and liquid chromatography-mass spectrometry measurements revealed a drastic reduction in rolC plants of iPA as well as in several other cytokinins tested, suggesting a possible reduction in the synthesis rate of

cytokinins. Furthermore, gas chromatography-mass spectrometry quantifications of GA19 showed a 5- to 6-fold increase in rolC plants compared with wild-type plants, indicating a reduced activity of the GA19 oxidase, a proposed regulatory step in the gibberellin biosynthesis. Thus, we conclude that RolC activity in transgenic plants leads to major alterations in the metabolism of cytokinins and gibberellins.

5/3,AB/68 (Item 21 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

02468386 Genuine Article#: LD639 Number of References: 33
Title: REGULATABLE ENDOGENOUS PRODUCTION OF CYTOKININS UP TO TOXIC LEVELS IN TRANSGENIC PLANTS AND PLANT-TISSUES (Abstract Available)
Author(s): AINLEY WM; MCNEIL KJ; HILL JW; LINGLE WL; SIMPSON RB; BRENNER ML ; NAGAO RT; KEY JL
Corporate Source: UNIV GEORGIA,DEPT BOT/ATHENS//GA/30602; UNIV GEORGIA,DEPT BOT/ATHENS//GA/30602; PLANT CELL RES INST/DUBLIN//CA/94568; UNIV MINNESOTA,DEPT HORT SCI/ST PAUL//MN/55108
Journal: PLANT MOLECULAR BIOLOGY, **1993**, V22, N1 (APR), P13-23
ISSN: 0167-4412
Language: ENGLISH Document Type: ARTICLE
Abstract: The effects of **expressing** a chimeric gene consisting of a soybean heat shock gene promoter and a sequence that encodes an enzyme catalyzing the synthesis of a potent phytohormone, the cytokinin iPMP, have been analyzed in transgenic tobacco plants. The production of cytokinin endogenously produced several effects previously undocumented. The differentiation of shoots independent of exogenous cytokinin from heat-treated transgenic plant leaf explants demonstrates that long-term heat treatments do not interfere with complex developmental processes. This extends the potential usefulness of heat shock gene promoters to conditionally **express** genes during windows of development that span several weeks.

5/3,AB/69 (Item 22 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

02452864 Genuine Article#: LC487 Number of References: 36
Title: LEVELS AND LOCATION OF **EXPRESSION** OF THE AGROBACTERIUM-TUMEFACIENS PTIA6 **IPT** GENE PROMOTER IN TRANSGENIC TOBACCO (Abstract Available)
Author(s): STRABALA TJ; CROWELL DN; AMASINO RM
Corporate Source: UNIV MISSOURI,DEPT BIOCHEM,117 SCHWEITZER HALL/COLUMBIA//MO/65211; UNIV WISCONSIN,DEPT BIOCHEM/MADISON//WI/53706; INDIANA UNIV PURDUE UNIV,DEPT BIOL/INDIANAPOLIS//IN/46202
Journal: PLANT MOLECULAR BIOLOGY, **1993**, V21, N6 (MAR), P1011-1021
ISSN: 0167-4412
Language: ENGLISH Document Type: ARTICLE
Abstract: The location of gene **expression** of the Agrobacterium tumefaciens **ipt** gene promoter in transgenic tobacco plants was examined using the beta-glucuronidase (GUS) reporter gene. **Expression** of GUS was detected in every organ and most cell types examined. The highest levels of GUS activity were found in roots. To further examine the transcriptional basis of this broad **expression** pattern, deletions in the 5' noncoding region of the gene were translationally fused to two promoterless reporter genes, encoding the enzymes chloramphenicol acetyl transferase (CAT) and beta-glucuronidase (GUS). Reporter enzyme assays revealed the existence of an upstream segment required for maximal promoter function, the 5' end of which is between -442 and -408 of the P(**ipt**) ATG codon.

This upstream segment is required for maximal levels of GUS **expression** in roots, but not in other organs, and a tobacco suspension-cultured cell line. The implications of broad **ipt expression** on the process of crown gall tumorigenesis are discussed.

5/3,AB/70 (Item 23 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

01983746 Genuine Article#: JR327 Number of References: 26
Title: ALTERED MORPHOLOGY IN TRANSGENIC TOBACCO PLANTS THAT OVERPRODUCE CYTOKININS IN SPECIFIC TISSUES AND ORGANS
Author(s): LI Y; HAGEN G; GUILFOYLE TJ
Corporate Source: UNIV MISSOURI,DEPT BIOCHEM,117 SCHWEITZER HALL/COLUMBIA//MO/65211
Journal: DEVELOPMENTAL BIOLOGY, **1992**, V153, N2 (OCT), P386-395
ISSN: 0012-1606
Language: ENGLISH Document Type: ARTICLE

5/3,AB/71 (Item 24 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

01921543 Genuine Article#: JL675 Number of References: 33
Title: CORRELATION BETWEEN THE **EXPRESSION** OF T-DNA IAA BIOSYNTHETIC GENES FROM DEVELOPMENTALLY REGULATED PROMOTERS AND THE DISTRIBUTION OF IAA IN DIFFERENT ORGANS OF TRANSGENIC TOBACCO (Abstract Available)
Author(s): SITBON F; LITTLE CHA; OLSSON O; SANDBERG G
Corporate Source: SWEDISH UNIV AGR SCI,DEPT FOREST GENET & PLANT PHYSIOL/S-90183 UMEA//SWEDEN/; SWEDISH UNIV AGR SCI,DEPT FOREST GENET & PLANT PHYSIOL/S-90183 UMEA//SWEDEN/; FORESTRY CANADA,MARITIMES REG/FREDERICTON E3B 5P7/NB/CANADA/
Journal: PHYSIOLOGIA PLANTARUM, **1992**, V85, N4 (AUG), P679-688
ISSN: 0031-9317
Language: ENGLISH Document Type: ARTICLE
Abstract: To alter the level and distribution of IAA in tobacco, the T-DNA iaaM gene was fused to the T(R)-DNA 1' promoter, and this construct was used to **transform** transgenic tobacco SR1 plants containing the natural iaaH gene. Coexpression of the 1'-iaaM and iaaH genes was associated with reduced plant height, leaf size, and internode diameter. Free and conjugated IAA levels were higher in 1'-iaaM/iaaH plants than in wild-type, most notably in the basal leaves and internodes.

Extending this work, hygromycin-resistant plants containing the iaaM gene **expressed** from either the 1', CaMV 35S or potato ST-LS1 promoters were crossed with a kanamycin-resistant 35S-iaaH plant. Transcription of the iaaM and iaaH genes, and levels of IAA and ABA were monitored in hygromycin- and kanamycin-resistant progeny. Growth was inhibited in all lines, particularly in 35S-iaaM x 35S-iaaH plants. The phenotypes of 1'-iaaM x 35S-iaaH and 35S-iaaM x 35S-iaaH plants were similar to those of 1'-iaaM/iaaH and 35S-iaaM/iaaH plants, respectively, indicating that iaaH **expression** does not limit IAA biosynthesis. Transcription of the iaaM gene varied between the lines, as well as within and between organs of the same line. An increased IAA level was associated with iaaM transcription in most organs. Overall, the ABA level was- higher in wild-type than in transgenic lines, but did not vary between the transgenic lines.

5/3,AB/72 (Item 25 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

01813216 Genuine Article#: JD358 Number of References: 25
Title: EFFECTS OF AGROBACTERIAL ONCOGENES IN KIDNEY VETCH (ANTHYLLIS-VULNERARIA L) (Abstract Available)
Author(s): STILLER J; NASINEC V; SVOBODA S; NEMCOVA B; MACHACKOVA I
Corporate Source: CZECHOSLOVAK ACAD SCI,INST PLANT MOLEC BIOL,DEPT NITROGEN FIXAT,BRANISOVSKA 31/CS-37005 CESKE BUDEJOVICE//CZECHOSLOVAKIA/; CZECHOSLOVAK ACAD SCI,INST EXPTL BOT/CS-16000 PRAGUE 6//CZECHOSLOVAKIA/
Journal: PLANT CELL REPORTS, **1992**, V11, N7 (JUL), P363-367
Language: ENGLISH Document Type: ARTICLE
Abstract: Kidney vetch seedlings were induced to form hairy roots by inoculating their mesocotyls with the wild-type strain 15834 of Agrobacterium rhizogenes or with the A. tumefaciens strain C58C1 containing a binary vector system (the pRiA4b as a helper and the vector pCB1346 bearing a pTiC58-derived **isopentenyl transferase** gene (**ipt**, cytokinin biosynthetic gene) under control of its native regulatory sequences). Transgenic lines of three distinct phenotypes were selected: (i) Typically, the pRi15834-**transformed** tissues were stabilized in vitro and maintained for long periods as aseptic, fast-growing, hormone-independent, plagiotropic hairy root cultures which never regenerated shoots and lost the ability to synthesize opines. Their genomic DNA contained both the T(L)- and the T(R)-DNA. (ii) One of the HR-lines transgenic for the T-DNA of pRi15834 (named 52AV34) started to regenerate spontaneously into teratomous shoots. The shoots were found to produce opines and both the T(L) and T(R) parts of T-DNA were found to be partly deleted and/or rearranged. They contained phytohormones in similar levels as those found in seed-born shoots. (iii) A practically identical morphogenic response as in the line 52AV34 was observed in the clone 27AV46. However, its shooty, dark-green, slow-growing teratomas were proven to be kanamycin-resistant, opine-producing, and double-**transformed** by the pRiA4b sequences and the **ipt** gene. They over-produced auxins as well as cytokinins (mainly indoleacetylaspartic acid and ribosides of zeatin and isopentenyladenine).

5/3,AB/73 (Item 26 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

01117725 Genuine Article#: FX732 Number of References: 42
Title: DELAYED LEAF SENESCENCE IN TOBACCO PLANTS **TRANSFORMED** WITH TMR, A GENE FOR CYTOKININ PRODUCTION IN AGROBACTERIUM (Abstract Available)
Author(s): SMART CM; SCOFIELD SR; BEVAN MW; DYER TA
Corporate Source: AFRC,INST GRASSLAND & ENVIRONM RES,WELSH PLANT BREEDING STN,PLAS GOGERDDAN/ABERYSTWYTH SY23 3EB/DYFED/WALES/; JOHN INNES CTR PLANT SCI RES,CAMBRIDGE LAB/NORWICH NR4 7UJ//ENGLAND/; JOHN INNES CTR PLANT SCI RES,SAINSBURY LAB/NORWICH NR4 7UJ//ENGLAND/
Journal: PLANT CELL, **1991**, V3, N7, P647-656
Language: ENGLISH Document Type: ARTICLE
Abstract: The aim of this study was to investigate whether enhanced levels of endogenous cytokinins could influence plant development, particularly leaf senescence. Tobacco plants were **transformed** with the Agrobacterium tumefaciens gene tmr, under the control of the soybean heat shock promoter HS6871. This gene encodes the enzyme **isopentenyl transferase**, which catalyzes the initial step in cytokinin biosynthesis. After heat shock, the cytokinin level increased greatly and the level of tmr mRNA, undetectable at 20-degrees-C, rose and remained high for up to 8 hours. The levels of cytokinin and tmr mRNA were substantially lower by 24 hours. **Transformed** plants grown at 20-degrees-C were shorter, had larger side shoots, and remained green for longer than untransformed plants.

The differences were more pronounced after several heat shocks of whole plants or defined areas of leaves. Our results demonstrated that plant morphology and leaf senescence can be manipulated by changing the endogenous level of cytokinins.

5/3,AB/74 (Item 27 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

01048832 Genuine Article#: FR384 Number of References: 26
Title: EFFECTS OF THE INTRODUCTION OF AGROBACTERIUM-TUMEFACIENS T-DNA **IPT** GENE IN NICOTIANA-TABACUM-L CV PETIT HAVANA SR1 PLANT-CELLS (Abstract Available)
Author(s): BEINSBERGER SEI; VALCKE RLM; DEBLAERE RY; CLIJSTERS HMM; DEGREEF JA; VANONCKELEN HA
Corporate Source: UNIV INSTELLING ANTWERP,DEPT BIOL/B-2610 WILRIJK//BELGIUM/; LIMBURGS UNIV CENTRUM,DEPT SBM/B-3590 DIEPENBEEK//BELGIUM/; STATE UNIV GHENT,GENET LAB/B-9000 GHENT//BELGIUM/
Journal: PLANT AND CELL PHYSIOLOGY, **1991**, V32, N4, P489-496
Language: ENGLISH Document Type: ARTICLE
Abstract: **Transformation** of tobacco leaf discs with the 'cytokinin' **ipt** gene yielded several transgenic callus tissue lines, respective to the kind of **ipt** construction present in the A. tumefaciens cointegrates. Those calli containing an active **ipt** gene were able to grow hormone-autotrophically and showed an increased endogenous cytokinin level in comparison with controls. Analysis of endogenous IAA level did not allow any quantitative correlation with the cytokinin content. However, a minimal level of auxin seems to be necessary to obtain hormone-autotrophic growth. Exogenously supplied NAA significantly reduced the endogenous cytokinin content without modifying growth characteristics.

The varying chlorophyll content in the different callus lines elicited the study of the ultrastructure of the plastids. The controls contained small plastids, often filled with starch or accumulated vesicles that did not allow observation of the internal membrane system. The 'Pssu-**ipt**' line, having a higher cytokinin content, showed plastids with an internal membrane system consisting of stroma and grana thylakoids, but this structure was lost during subculture. Swollen thylakoids appeared, the amount of starch was reduced and vesicles were accumulating.

5/3,AB/75 (Item 1 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03970756 CAB Accession Number: 20001616629
Is ethylene involved in inhibition of root growth in transgenic lines overproducing cytokinins?
Purushothama, M. G.; Nadaradjan, S.; Dhanalakshmi, R.; Sashidhar, V. R.; Prasad, T. G.
Department of Crop Physiology, University of Agricultural Sciences, GKVK, Bangalore 560 065, India.
Journal of Plant Biology vol. 26 (1): p.93-95
Publication Year: 1999 --
Language: English
Document Type: Journal article
Overexpression of the gene encoding isopentenyltransferase (**ipt**), an enzyme in cytokinin biosynthesis, indicated that phenotypic abnormalities in the transgenic tobacco plants are closely associated with enhanced ethylene production and the severity increased in the presence of auxin. It is concluded that ethylene is involved in cytokinin

overproduction in transgenic lines. 15 ref.

5/3,AB/76 (Item 2 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03861633 CAB Accession Number: 20001607693
Unpredictable phenotype change connected with Agrobacterium tumefaciens mediated **transformation** of non-ripening tomato mutant.
Bartoszewski, G.; Fedorowicz, O.; Malepszy, S.; Smigocki, A.; Niemirowicz-Szczytt, K.
Department of Plant Genetics, Breeding and Biotechnology, Warsaw Agricultural University, Poland.
Biology and biotechnology of the plant hormone ethylene II. Proceedings of the EU-TMR-Euroconference Symposium, Thira (Santorini), Greece, 5-8 September, 1998.
Conference Title: Biology and biotechnology of the plant hormone ethylene II. Proceedings of the EU-TMR-Euroconference Symposium, Thira (Santorini), Greece, 5-8 September, 1998.
p.399-400
Publication Year: 1999
Editors: Kanellis, A. K.; Chang, C.; Klee, H.; Bleecker, A. B.; Pech, J. C.; Grierson, D.
Publisher: Kluwer Academic Publishers -- Dordrecht, Netherlands
ISBN: 0-7923-5941-0
Language: English
Document Type: Conference paper
A non-ripening (nor) tomato (Lycopersicon esculentum) mutant was **transformed** with an **isopentenyl transferase** gene under heat shock promoter control. Of the 18 transgenic plants regenerated, 3 produced normally ripening fruits. One plant was tetraploid, resulting in changed leaf morphology, one was a typical nor mutant and the third was a chimaeric plant. Segregation of progeny did not correspond to any Mendelian ratio. 3 ref.

5/3,AB/77 (Item 3 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03846223 CAB Accession Number: 20001606745
Improvement of forage crop yield and retardation of leaf senescence by introduction of gene for cytokinin synthetase into plants.
Lee, B. H.; Won, S. H.; Lee, H. S.; Kim, K. Y.; Kim, M. H.; Eun, S. J.; Jo, J.
College of Agriculture, Kyungpook National University, Taegu 702-701, Korea Republic.
Journal of the Korean Society of Grassland Science vol. 19 (3): p.281-290
Publication Year: 1999
ISSN: 1013-9354 --
Language: Korean Summary Language: english
Document Type: Journal article
The bacterial **isopentenyl transferase** (**ipt**) gene involved in cytokinin biosynthesis was fused with 35S promoter of cauliflower mosaic virus and introduced into tobacco plants (Nicotiana tabacum cv. Samsun) via Agrobacterium tumefaciens-mediated **transformation**. As expected, **ipt** was constitutively **expressed** in all tissues of transgenic plants. Several primary transgenic plants were obtained that **expressed** different levels of transcripts for **ipt**. Three transgenic plants with different **expression** levels of **ipt** were selected and selfed to obtain homozygous lines for further analysis. A number of interesting phenotypic

changes, such as viviparous leaves, delayed senescence, larger axillary shoots, an abundance of tiny shoots at the apex and a release of lateral buds, were observed in transgenic plants. Chlorophyll content was 1.5- to 4-fold higher in transgenic plants as compared with non-**transformed** plants. These results indicate that the cytokinin synthesized in transgenic plants could improve forage crop yield by delaying leaf senescence and increasing leaf number. 19 ref.

5/3,AB/78 (Item 4 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03771904 CAB Accession Number: 991609280
Increased steady state mRNA levels of the STM and KNAT1 homeobox genes in cytokinin overproducing Arabidopsis thaliana indicate a role for cytokinins in the shoot apical meristem.
Rupp, H. M.; Frank, M.; Werner, T.; Strnad, M.; Schmulling, T.
Universitat Tubingen, Centre for Plant Molecular Biology (ZMBP), Allgemeine Genetik, Auf der Morgenstelle 28, D-72076 Tubingen, Germany.
Plant Journal vol. 18 (5): p.557-563
Publication Year: 1999
ISSN: 0960-7412
Language: English
Document Type: Journal article
This study investigates the consequences of endogenously enhanced biosynthesis of the plant hormone cytokinin in Arabidopsis thaliana. Transcriptional control of the bacterial **ipt** gene by the Drosophila melanogaster hsp70 (heat shock protein) promoter enabled temperature-dependent increased cytokinin production in transgenic plants. Heat-treated plants accumulated higher levels of unbound and bound zeatin-type cytokinins, the latter being preferentially N-conjugated glucosides. Cytokinin overproduction significantly increased the biomass of seedlings. **Ipt** transgenics had higher steady state mRNA levels of the shoot meristem specifying homeobox genes KNAT1 and STM, similar to the cytokinin-overproducing shoot meristem mutant amp1 (hpt, cop2, pt). This finding, together with previously described phenotypic similarities between transgenic cytokinin-overproducing plants and plants overexpressing the KNAT1 or KN1 genes, suggests that these factors act on the same pathway. It is hypothesized that cytokinins act upstream of KNAT1 and STM. The influence of cytokinins on homeobox genes provides a link between the hormone and the developmental genes and indicates a role for cytokinins in the shoot apical meristem. 37 ref.

5/3,AB/79 (Item 5 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03759434 CAB Accession Number: 991608236
Plant **transformation**: advances and perspectives.
Alves, A. C.; Quecini, V. M.; Vieira, M. L. C.
Depto. de Genetica-ESALQ/USP, CP 83, CEP 13400-970 Piracicaba, Brazil.
Scientia Agricola vol. 56 (1): p.1-7
Publication Year: 1999
Language: English Summary Language: portuguese
Document Type: Journal article
In this review, recent approaches for foreign gene introduction (biolistics, whole tissue electroporation, in planta Agrobacterium **transformation**), screening (reporter gene possibilities and performance) and **transformant** selection (**ipt** selective marker) are discussed. Transgene **expression** and mechanisms underlying (trans)gene inactivation are presented. Practical applications of genetically modified plants, field tests and commercial transgenic crops

worldwide and in Brazil are listed, as well as the main traits and species modified. Potential uses of transgenic plants for animal feed production, biological remediation and synthetic polymer assembly are also mentioned. 84 ref.

5/3,AB/80 (Item 6 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03729154 CAB Accession Number: 991605931
Cytokinin content and location in the leaves of the wild-type and transgenic tobacco plants.
Veselov, S. Yu.; Valcke, R.; Onckelen, H. van; Kudoyarova, G. R.
Bashkortostan State University, ul. Frunze 32, Ufa, 450074, Russia.
Russian Journal of Plant Physiology vol. 46 (1): p.26-31
Publication Year: 1999
ISSN: 1021-4437 --
Language: English
Document Type: Journal article
Cytokinin content was assayed in leaves of non-**transformed** tobacco plants and those **transformed** with a genetic construct containing the light-inducible ipt gene, using liquid chromatography followed by mass spectrophotometry and by thin-layer chromatography combined with a immunoenzyme assay. Immunocytological location of phytohormones was investigated after successively treating plant tissue sections with polyclonal antibodies against zeatin riboside, species-specific immunoglobulins labelled with colloid gold and a silver preparation. Cytokinin content in leaves of **transformed** plants was higher than in those of wild-type plants. The bottom leaves of the former accumulated zeatin nucleotides. The contents of zeatin and zeatin riboside in the upper leaves exceeded that in the lower leaves both in **transformed** and wild-type plants. Staining confirmed that the contents of zeatin and zeatin riboside in the leaves were correlated with the intensity of immunostaining of leaf sections. High zeatin content in the bottom leaves of transgenic plants did not affect the level of immunostaining. 17 ref.

5/3,AB/81 (Item 7 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03713434 CAB Accession Number: 991604775
Developmental targeting of gene **expression** by the use of a senescence-specific promoter.
Gan SuSheng; Amasino, R. M.
Tobacco and Health Research Institute and Department of Agronomy, Cooper and University Drives, University of Kentucky, Lexington, KY 40546-0236, USA.
Book Title: Inducible gene **expression** in plants.
p.169-186
Publication Year: 1999
Editors: Reynolds, P. H. S.
Publisher: CAB INTERNATIONAL -- Wallingford, UK
ISBN: 0-85199-259-5
Language: English
Document Type: Book chapter
Leaf senescence, like many other plant developmental processes, is a genetically controlled programme that is regulated by a complex array of environmental and internal factors. This final phase of plant development is different from other developmental events not only temporally but also biochemically and genetically, which provides unique opportunities for targeting gene **expression** for both basic and applied research. This chapter describes senescence-targeted **isopentenyl transferase**

(**IPT**) gene **expression** using a senescence-specific promoter for studies of cytokinin biology. In addition to considering the development of a **ipt expression** system, studies on the genetic **transformation** of tobacco with senescence-associated genes (SAG) are described. Molecular evidence for the autoregulatory nature of the SAG12-**IPT** system is discussed. 43 ref.

5/3,AB/82 (Item 8 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03546296 CAB Accession Number: 981605553
Seed-specific **expression** of the **isopentenyl transferase** gene (**ipt**) in transgenic tobacco.
Ma QingHu; Zhang, R.; Hocart, C. H.; Letham, D. S.; Higgins, T. J. V. Ma Ma
CSIRO Division of Plant Industry, GPO Box 1600, Canberra, ACT 2601, Australia.
Australian Journal of Plant Physiology vol. 25 (1): p.53-59
Publication Year: 1998
ISSN: 0310-7841 --
Language: English
Document Type: Journal article
Agrobacterium tumefaciens gene **ipt**, a cytokinin biosynthetic gene encoding **isopentenyl transferase**, was fused to a promoter from a seed-specific gene, vicilin, and introduced into tobacco cells. Intact fertile plants were generated. **Expression** of the vicilin-**ipt** gene was confined to seeds and resulted in enhanced levels of cytokinins in developing seeds and increased seed protein content. Using a simplified quantification method, a significant increase in the levels of endogenous cytokinins was recorded at 16-21 days after flowering. Growth and morphology (pod numbers/plant and seeds/pod) of the transgenic plants and seed germination were normal. 30 ref.

5/3,AB/83 (Item 9 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03450465 CAB Accession Number: 971610583
Properties of plasma membranes of Phsp 70-**ipt transformed** tobacco (Nicotiana tabacum).
Bultynck, L.; Geuns, J. M. C.; Ginkel, G. van; Caubergs, R. J.
Ruca, Groenenborgerlaan 171, 2020 Antwerp, Belgium.
Phytochemistry vol. 45 (7): p.1337-1341
Publication Year: 1997
ISSN: 0031-9422 --
Language: English
Document Type: Journal article
Application of 10 successive daily heat shocks reduced the growth of control tobacco (Nicotiana tabacum cv. Petit Havana SR1) plants by about 15%; for Phsp 70-**ipt transformed** plants this was about 48%. The shoot diameter of these **ipt-transformed** plants increased by about 75%. In addition, in heat shock treated **ipt**-plants (**IPT**-HS) the upper lateral buds grew out due to a reduction of apical dominance. The older leaves of **IPT** -HS plants had a higher chlorophyll content. In spite of the observed effects due to a higher endogenous cytokinin content in the **IPT**-HS plants, no significant changes were observed on the plasma membrane fatty acid composition, nor on its fluidity as determined from the steady-state fluorescence anisotropy of DPH. Only a minor change in the plasma membrane free sterol composition was found as evidenced by a 20% decrease in the stigmasterol to sitosterol ratio in **IPT** -HS, indicative for a possible

anti-senescence effect of enhanced endogenous cytokinins, but without significant effects on the plasma membrane function. 26 ref.

5/3,AB/84 (Item 10 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03434750 CAB Accession Number: 971610240
Conditional transgenic **expression** of the **ipt** gene indicates a function for cytokinins in paracrine signaling in whole tobacco plants.
Faiss, M.; Zalubilova, J.; Strnad, M.; Schmulling, T.
Universitat Tubingen, Lehrstuhl fur Allgemeine Genetik, Auf der Morgenstelle 28, D-72076 Tubingen, Germany.
Plant Journal vol. 12 (2): p.401-415
Publication Year: 1997
ISSN: 0960-7412 --
Language: English
Document Type: Journal article
This study investigated whether an increased production of the plant hormone cytokinin in roots, the main site of its synthesis and the putative signalling organ, can influence developmental events, such as growth of axillary shoot meristems or leaf senescence, in the plant shoot. To this end, transgenic tobacco plants (Nicotiana tabacum) were generated that conditionally overproduced cytokinins. These plants harboured the Agrobacterium tumefaciens **ipt** gene under the transcriptional control of a modified CaMV 35S promoter that is repressed in plants with high titres of tetracycline repressor protein. De-repression of transcription led to a rapid >50-fold increase in hormone concentration. The time course of changes in the steady-state levels of 16 different cytokinin metabolites, as a consequence of **IPT** enzyme activity, was monitored in different plant tissues. Zeatin riboside was the first and most significantly increased product; zeatin, dihydrozeatin and glucosides accumulated later. The consequences of enhanced cytokinin synthesis remained mainly restricted to the site of hormone production. For example, de-repression of **ipt** gene transcription in lateral buds caused the growth of single buds only at the site of tetracycline application. In reciprocal grafts of transgenic plants with wild-type plants, no biological cytokinin effects, i.e. growth of lateral shoot meristems or sequential leaf senescence, were observed in the non-transgenic plant part. Also, the increase in steady-state levels of cytokinins remained restricted mainly to the transgenic part, despite a specific increase of the zeatin riboside concentration in the transpiration stream. These results question the role of cytokinins as a long-range root-to-shoot signal in correlative control of apical dominance and sequential leaf senescence of tobacco, and support the assumption that this hormone is relevant to paracrine signalling. 50 ref.

5/3,AB/85 (Item 11 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03400637 CAB Accession Number: 970607533
Auxin-cytokinin interactions in transgenic plants **expressing** the A. tumefaciens **ipt**, iaaaM and iaaaH genes.
Eklof, S.
Department of Forest Genetics and Plant Physiology, Swedish University of Agricultural Sciences, S-901 83 Umea, Sweden.
Acta Universitatis Agriculturae Sueciae - Silvestria
(No. 15): 45 pp.
Publication Year: 1996
Publisher: Swedish University of Agricultural Sciences -- Uppsala, Sweden

ISBN: 91-576-5219-8
Language: English Summary Language: swedish
Document Type: Thesis
The thesis is based on six papers (included as an appendix), and presents results from studies on how plant morphology is influenced by cytokinins and auxins, their metabolism and interactions. The studies were mainly conducted with tobacco plants (Nicotiana tabacum cultivars), with hybrid aspen (Populus tremula x P. tremuloides) chosen for **transformation** with the promoter-less **ipt** gene. Protein synthesis in the cambial region of Scots pine (Pinus sylvestris) shoots during reactivation was also studied; understanding and control of growth and development of commercial Swedish forest species such as Scots pine is a long-term aim. 8 pp. of ref.

5/3,AB/86 (Item 12 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03392367 CAB Accession Number: 971606920
The **expression** of GUS gene driven by T-cyt promoter in transgenic tobacco and potato.
Ma Mi; Zhou DaFeng; Guo Yang; Kuang TingYun; Tang PeiSong; Lin ZhongPing
Institute of Botany, Academia Sinica, Beijing 100093, China.
Acta Botanica Sinica vol. 38 (3): p.169-173
Publication Year: 1996
ISSN: 0577-7496 --
Language: Chinese Summary Language: english
Document Type: Journal article
The location of GUS (uidA) gene **expression** under control of the T-cyt gene promoter (gene 4 of T-DNA encoding **isopentenyl transferase**) (from Agrobacterium tumefaciens) was examined by biochemical assays in transgenic tobacco (Nicotiana tabacum cv. W38) and potato (Solanum tuberosum cv. Desiree) plants. Results showed that T-cyt was **expressed** in roots, stems, leaves and buds, and the highest levels of GUS activity were found in tobacco stems during axillary bud initiation and in potato buds on tubers. Levels of **expression** were also high in wounded leaves of transgenic potato. GUS **expression** was induced in transgenic tobacco stems by cytokinin treatment but not by auxin treatment, indicating that the T-cyt promoter might be selectively induced by exogenous plant hormones. 11 ref.

5/3,AB/87 (Item 13 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03349375 CAB Accession Number: 970702644
Combined effects of auxin transport inhibitors and cytokinin: alterations of organ development in tobacco.
Strabala, T. J.; Wu, Y. H.; Li, Y.
Department of Biochemistry, University of Missouri-Columbia, Columbia, MO 65211, USA.
Plant and Cell Physiology vol. 37 (8): p.1177-1182
Publication Year: 1996
ISSN: 0032-0781 --
Language: English
Document Type: Journal article
The effects of the auxin transport inhibitors 1-naphthylphthalamic acid (NPA) and 2,3,5-triodobenzoic acid (TIBA) on leaf morphogenesis of transgenic Nicotiana tabacum (cv. Xanthi) plants **expressing** the Agrobacterium tumefaciens cytokinin biosynthetic gene, **ipt**, were examined. The formation of saucer-shaped leaf-like organs at the shoot apex and at lateral buds was observed. The formation of apical

saucer-shaped leaf-like organs could be duplicated by the application of exogenous NPA and cytokinin to wild-type tobacco seedlings. Adventitious leaf-like organs with altered petiole and blade morphology were also observed in the transgenic plants treated with auxin transport inhibitors. It is suggested that the combination of diminished auxin transport and elevated cytokinin can lead to alterations in leaf development in tobacco. 34 ref.

5/3,AB/88 (Item 14 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03305917 CAB Accession Number: 961611504
Effect of cytokinin on alkaloid accumulation in periwinkle callus cultures **transformed** with a light-inducible **ipt** gene.
Garnier, F.; Carpin, S.; Label, P.; Creche, J.; Rideau, M.; Hamdi, S.
EA 1370, Laboratoire de Biologie Cellulaire et Biochimie Vegetale, Faculte de Pharmacie, 31 avenue Monge, 37200 Tours, France.
Plant Science (Limerick) vol. 120 (1): p.47-55
Publication Year: 1996
ISSN: 0168-9452 --
Language: English
Document Type: Journal article
The effect of cytokinins on accumulation of indole alkaloids in periwinkle (Catharanthus roseus) callus cultures was investigated. Firstly, it was found that exogenously-applied cytokinin increased the ajmalicine and serpentine content of untransformed callus culture obtained from cotyledons. Secondly, periwinkle cotyledons were **transformed** with the **isopentenyl transferase** (**ipt**) gene under the control of a light-inducible promoter and two **transformed** callus lines were used in order to investigate whether endogenously-produced cytokinin could also increase the alkaloid production. It was found that the **ipt**-transgenic tissues accumulated higher levels of **isopentenyl transferase** transcripts as well as zeatin riboside, even under non-inductive condition, but lower concentration of alkaloids compared to that of untransformed tissues. A 28 kDa polypeptide whose accumulation was previously found to be associated with alkaloid production in a periwinkle cell suspension was also present in the non-**transformed** tissue and its level was increased in parallel to the cytokinin-enhanced alkaloid production. Neither light induction condition, nor exogenous cytokinin treatment led to the increase of the 28 kDa polypeptide accumulation in the **transformed** tissues. All these data show that endogenously-produced cytokinin does not mimic the effect of exogenously-applied cytokinin on the alkaloid production in periwinkle calli. 34 ref.

5/3,AB/89 (Item 15 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03305846 CAB Accession Number: 961611433
Transgenic periwinkle tissues overproducing cytokinins do not accumulate enhanced levels of indole alkaloids.
Garnier, F.; Label, P.; Hallard, D.; Chenieux, J. C.; Rideau, M.; Hamdi, S.
EA 1370, Laboratoire de Biologie Cellulaire et Biochimie Vegetale, Faculte de Pharmacie, 31 avenue Monge, 37200 Tours, France.
Plant Cell, Tissue and Organ Culture vol. 45 (3): p.223-230
Publication Year: 1996
ISSN: 0167-6857 --
Language: English
Document Type: Journal article

Cytokinins play a critical role in several aspects of plant growth, metabolism and development. It has been reported previously that adding cytokinins to the culture medium of a suspension-cultured cell line of periwinkle (Catharanthus roseus) increased the accumulation of indole alkaloids. Studies were conducted to investigate the effects of exogenously applied cytokinins and elevated levels of endogenous cytokinins on indole alkaloid production. An Agrobacterium tumefaciens strain yielding a plasmid with the **isopentenyl transferase** gene under control of its own promoter was used. Co-culture of suspension cells with the bacteria caused a severe stress response leading to cell necrosis; thus, this material was not **transformed** . However, periwinkle cotyledons were successfully **transformed** . It was confirmed that callus cultures generated from the **isopentenyl transferase** -transgenic cotyledons accumulated high cytokinin concentrations. Treating normal callus cultures (generated from untransformed cotyledons) with cytokinins enhanced their alkaloid production. In contrast, the enhanced concentration of endogenous cytokinins in transgenic calluses did not increase indole alkaloid production, and thus did not mimic the effect of exogenously applied cytokinins. Hypotheses to explain this discrepancy are discussed. 33 ref.

5/3,AB/90 (Item 16 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03305776 CAB Accession Number: 961611363
Effect of alien **ipt** gene on hormonal concentrations of plants.
Makarova, R. V.; Borisova, T. A.; Machackova, I.; Kefeli, V. I.
Timiryazev Institute of Plant Physiology, Russian Academy of Sciences, ul. Botanicheskaya 35, Moscow 127276, Russia.
Plant hormone signal perception and transduction: Proceedings of the International Symposium, Moscow, Russia, September 4-10, 1994.
Conference Title: Plant hormone signal perception and transduction: Proceedings of the International Symposium, Moscow, Russia, September 4-10, 1994.
p.171-173
Publication Year: 1996
Editors: Smith, A. R.; Berry, A. W.; Harpham, N. V. J.; Moshkov, I. E.; Novikova, G. V.; Kulaeva, O. N.; Hall, M. A.
Publisher: Kluwer Academic Publishers -- Dordrecht, Netherlands
ISBN: 0-7923-3768-9
Language: English
Document Type: Conference paper
Transgenic plants carrying the **isopentenyl transferase** gene (**ipt**) and normal tobacco plants (Nicotiana tabacum) were analysed to compare their phytohormone status. Total cytokinin (zeatin, zeatin riboside, isopentenyladenine and isopentenyladenosine) level and free IAA content were always higher in shoots regenerated from transgenic cultures although the concentrations were lower in roots. In transgenic plants, IAA-oxidase activity was lower and the concentration of its protectant chlorogenic acid was increased. Transgenic plants also contained lower concentrations of abscisic acid. 14 ref.

5/3,AB/91 (Item 17 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03267357 CAB Accession Number: 961608754
Cytokinins in plant senescence: from spray and pray to clone and play.
Gan SuSheng; Amasino, R. M.
Department of Biochemistry, 420 Henry Mall, University of Wisconsin, Madison, WI 53706-1569, USA.

BioEssays vol. 18 (7): p.557-565
Publication Year: 1996
ISSN: 0265-9247 --
Language: English
Document Type: Journal article

Three approaches have been used to investigate the inhibitory role of the cytokinin class of phytohormones in plant senescence: external application of cytokinins; measurement of endogenous cytokinin levels before and during senescence; and manipulation of endogenous cytokinin production in transgenic plants. In transgenic plant studies, endogenous cytokinin levels are manipulated by **expression** of **IPT**, a gene encoding **isopentenyl transferase**. Transgenic plants **expressing IPT** from a variety of promoters exhibit developmental and morphological alterations, and often display retarded leaf senescence. A recently developed autoregulatory senescence-inhibition system targets cytokinin production quantitatively, spatially and temporally, and results in transgenic plants that exhibit significantly delayed senescence without abnormalities. These transgenic studies not only confirm the regulatory role of cytokinins in plant senescence, but also provide a way to manipulate senescence for potential agricultural applications. 71 ref.

5/3,AB/92 (Item 18 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03242698 CAB Accession Number: 961606308
Agrobacterium-mediated **transformation** of commercial mints.
Berry, C.; Eck, J. M. van; Kitto, S. L.; Smigocki, A.
Delaware Agricultural Experiment Station, Department of Plant and Soil Sciences, College of Agricultural Sciences, University of Delaware, Newark, DE 19717-1303, USA.
Plant Cell, Tissue and Organ Culture vol. 44 (2): p.177-181
Publication Year: 1996
ISSN: 0167-6857 --
Language: English
Document Type: Journal article

Commercial peppermint (P; Mentha x piperita cv. Black Mitcham), native spearmint (NS; M. spicata) and Scotch spearmint (SS; M. x gracillis (M. x gracilis) cv. Baker) petioles, and orange mint (OM; M. (piperita var.) citrata) leaf discs were cocultivated with a number of Agrobacterium tumefaciens strains. P, SS and OM initiated tumour-like callus tissue on growth regulator-free MS medium after cocultivation with strain A281, a hypervirulent agropine strain containing Ti plasmid pTiBo542. Callus did not initiate from explants cocultivated with strain C58, a virulent nopaline strain, with A136, a plasmidless strain, or from uninoculated controls. A281-derived callus was maintained on growth regulator-free medium in the absence of antibiotics for up to two years with no bacterial outgrowth. No shoots regenerated from any of the tumours on regeneration medium. Five of seven OM callus lines assayed gave a positive signal for agropine. DNA extracted from OM tumour tissue hybridized to a DNA probe specific to the T-DNA region of pTi plasmid. Genomic Southern analysis of DNA from tumours of P and SS indicated that one to a few copies of the T-DNA integrated into the mint chromosomes. PCR amplification of genomic DNA with primers specific for one of the T-DNA encoded genes yielded fragments that, when analysed by restriction enzyme mapping and on Southern blots, corresponded to the cytokinin biosynthesis gene **ipt** (**isopentenyl transferase**). These results demonstrate **transformation** of three species of mint and the potential for using A. tumefaciens to transfer economically important genes into commercial mint cultivars. 11 ref.

5/3,AB/93 (Item 19 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03192474 CAB Accession Number: 961602774
Expression of the **isopentenyl transferase** gene is regulated by auxin in transgenic tobacco tissues.
Zhang, X. D.; Letham, D. S.; Zhang, R.; Higgins, T. J. V.
CSIRO Division of Plant Industry, GPO Box 1600, Canberra, ACT 2601, Australia.
Transgenic Research vol. 5 (1): p.57-65
Publication Year: 1996
ISSN: 0962-8819 --
Language: English
Document Type: Journal article
The **isopentenyl transferase** gene (**ipt**) from Agrobacterium tumefaciens was isolated and introduced, via a disarmed binary vector, into tobacco using the Agrobacterium tumefaciens-mediated gene transfer system. The **expression** of the **ipt** gene was monitored by RNA hybridization, western blotting and cytokinin analysis. The addition of auxin to the media rapidly reduced the level of cytokinins in the transgenic tissues and this was associated with a reduction in **IPT** mRNA and protein levels. It is concluded that the hormone auxin can regulate **expression** of a gene involved in biosynthesis of the second hormone cytokinin. Although exogenous benzyladenine did not directly affect **ipt** gene **expression**, it did antagonize the effect of auxin on levels of cytokinins and **IPT** mRNA and protein. 48 ref.

5/3,AB/94 (Item 20 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03191981 CAB Accession Number: 961602281
The pattern of cytokinin content in transgenic and wild-type tobacco seedlings as affected by heat shock.
Veselov, S. Y.; Kudoyarova, G. R.; Mustafina, A. R.; Valcke, R.
Institute of Biology, Bashkir Scientific Center, Russian Academy of Sciences, pr. Oktyabrya 69, Ufa, Bashkortostan 450054, Russia.
Russian Journal of Plant Physiology vol. 42 (5): p.617-620
Publication Year: 1995
ISSN: 1021-4437 --
Language: English
Document Type: Journal article
The pattern of the endogenous cytokinin content was monitored during the day in the shoots of transgenic tobacco (Nicotiana tabacum) plants containing a heat-inducible **ipt** gene responsible for **isopentenyl transferase** synthesis. Heating transgenic plants at 40 deg C for 1 h yielded an increase in endogenous cytokinins, as compared to the normal level in the plants kept at 24 deg C for the whole period. However, this increase was not permanent, as after 5 h following heat-shock treatment, there was essentially no difference in cytokinin content between heated and untreated plants. In the shoots of wild-type tobacco, heat shock activated the processes diminishing cytokinin concentration, which are the typical plant response to heat shock. When such a response also manifests itself in transgenic plants, it can cause a transient cytokinin accumulation after heat shock treatment. 12 ref.

5/3,AB/95 (Item 21 from file: 50)
DIALOG(R)File 50:CAB Abstracts

03164555 CAB Accession Number: 961600117

Agrobacterium-mediated **transformation** of the apple cultivar Granny Smith.

Trifonova, A.; Savova, D.; Ivanova, K.

Institute of Genetic Engineering, 2232 Kostinbrod, Bulgaria.

Progress in temperate fruit breeding. Proceedings of the Eucarpia Fruit Breeding Section Meeting, Wadenswil/Einsiedeln, Switzerland, 30 August to 3 September, 1993.

Conference Title: Progress in temperate fruit breeding. Proceedings of the Eucarpia Fruit Breeding Section Meeting, Wadenswil/Einsiedeln, Switzerland, 30 August to 3 September, 1993.

p.343-347

Publication Year: 1994

Editors: Schmidt, H.; Kellerhals, M.

Publisher: Kluwer Academic Publishers -- Dordrecht, Netherlands

ISBN: 0-7923-2947-3

Language: English

Document Type: Conference paper

An efficient adventitious shoot regeneration system from leaf segments of the apple cultivar Granny Smith was developed. Regenerants in sufficient frequency were obtained under the optimal conditions in presence of 3 mg BA, 2 mg 2iP and 0.2 mg NAA/litre. Putative transgenic plants were regenerated from leaf segments that were co-cultivated with disarmed C58 Agrobacterium tumefaciens strain containing either of the following binary plasmids: pGV2449 or pGV2492. The chimaeric marker gene for neomycin phosphotransferase II (nptII) and **ipt** genes (encoding for **isopentenyl transferase**, the first enzyme in the cytokinin biosynthetic pathway) were ~~integrated in~~ both plasmid derivatives. Seven ~~putative transg~~enic plants were obtained on the selective medium containing 50 micro g/ml kanamycin after **transformation** with pGV2449. The **expression** and integration of nptII marker gene was detected in leaves of the plants. Rooting of the propagated plants was only achieved in presence of anticytokinin substance, 4-substituted-triazolo (4,5,d) pyrimidine and 0.5 mg IBA/litre. 11 ref.

5/3,AB/96 (Item 22 from file: 50)

DIALOG(R)File 50:CAB Abstracts

03060158 CAB Accession Number: 951608688

Cytokinin involvement in the control of coumarin accumulation in Nicotiana tabacum. Investigations with normal and **transformed** tissues carrying the **isopentenyl transferase** gene.

Hamdi, S.; Creche, J.; Garnier, F.; Mars, M.; Decendit, A.; Gaspar, T.; Rideau, M.

Laboratoire de Biologie Cellulaire et Biochime Vegetale, Faculte de Pharmacie, EA 1370, 37200 Tours, France.

Plant Physiology and Biochemistry (Paris) vol. 33 (3): p.283-288

Publication Year: 1995

ISSN: 0981-9428 --

Language: English

Document Type: Journal article

The effects of cytokinins on accumulation of the coumarin scopolin in tobacco tissues were investigated. Leaf discs were **transformed** with the Agrobacterium tumefaciens **ipt** gene under control of either its native promoter or a light-inducible (Rubisco (ribulose-bisphosphate carboxylase/oxygenase)) promoter. Several shoot cultures were isolated, from which **ipt** transgenic callus cultures were initiated. Leaves from all the **ipt** transgenic shoot cultures (grown in light) accumulated a high level of scopolin, whereas control (untransformed) leaves did not. Callus cultures carrying **ipt** under the control of its own promoter accumulated higher contents of scopolin as compared with untransformed calluses, irrespective of light or dark conditions.

Dark-grown callus cultures carrying **ipt** under the control of the light-inducible promoter accumulated scopolin to levels comparable with untransformed calluses. Transferring transgenic calluses from dark to light, or adding a cytokinin to the culture medium resulted in an increase of the scopolin content. Exogenously applied cytokinin also increased the scopolin content of untransformed callus cultures. These data indicated that cytokinins control coumarin accumulation, and that enhanced levels of endogenous cytokinins could mimic the effect of exogenous cytokinins on coumarin pathway in tobacco tissues. 27 ref.

5/3,AB/97 (Item 23 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02924669 CAB Accession Number: 941610347
Cytokinin accumulation and action: biochemical, genetic, and molecular approaches.
Binns, A. N.
Plant Science Institute, Department of Biology, University of Pennsylvania, Philadelphia, PA 19104-6018, USA.
Annual Review of Plant Physiology and Plant Molecular Biology vol. 45 p.173-196
Publication Year: 1994
ISSN: 1040-2519 --
Language: English
Document Type: Journal article
Progress in identifying the genes and gene products involved in cytokinin control of growth and development is reviewed. Biochemical approaches are considered under the headings cytokinin biosynthesis, cytokinin metabolism and cytokinin receptors. Genetic approaches to the study of cytokinins have made use of cytokinin accumulation mutants and cytokinin response mutants. The molecular approaches discussed include those used in the study of cytokinin control of gene **expression** and transgenic plants **expressing** the **ipt** gene (encoding isopentenyltransferase) from Agrobacterium tumefaciens. 134 ref.

5/3,AB/98 (Item 24 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02899052 CAB Accession Number: 941609077
Genetic **transformation** of some poplar clones.
Original Title: **Transformarea** gentica a unor clone de plop.
Ionita, L.
Institutul de Cercetari si Amenajari Silvice, 72902 Bucharest, Romania.
Probleme de Genetica Teoretica si Aplicata vol. 25 (2): p.99-111
Publication Year: 1993 --
Language: Romanian Summary Language: english
Document Type: Journal article
The clones used were 717 1B4 (Populus tremula x P. alba (P. canescens)), Beaupre and Boelare (both P. trichocarpa x P. deltoides (P. interamericana)) and Ogy (P. deltoides x P. nigra (P. canadensis)). The genetic **transformation** was by coculture with Agrobacterium tumefaciens. Different vectors were tested. Clone 717 1B4 was successfully **transformed** using plasmid p35SASOM3C carrying the gene for O-methyltransferase (involved in lignin synthesis). The other 3 clones showed no regeneration when **transformed** with the same constructs. A cloning strategy was developed for the Tmr (**Ipt**) gene with the PRI-a promoter. This gene codes for an enzyme involved in the synthesis of cytokinins and when introduced into the plant genome conditions an acceleration of growth. Earlier tests involving **transformation** with this gene led to an abnormal development of **transformed** plants;

hence the use in this case of an inducible promoter (PRI-a), which allows control of gene **expression** in the plant. 8 ref.

5/3,AB/99 (Item 25 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02898876 CAB Accession Number: 941608900
Morphometric analysis of the growth of Phsp 70-**ipt** transgenic tobacco plants.
Loven, K. van; Beinsberger, S. E. I.; Valcke, R. L. M.; Onckelen, H. A. van; Clijsters, H. M. M.
Limburgs Universitair Centrum (LUC), Department SBG, Universitaire Campus, 3590 Diepenbeek, Belgium.
Journal of Experimental Botany vol. 44 (268): p.1671-1678
Publication Year: 1993
ISSN: 0022-0957 --
Language: English
Document Type: Journal article
The effect of introducing a supplementary **ipt**-gene into the genome of Nicotiana tabacum cv. Petit Havana SR1 was studied. The **ipt**-gene, accounting for the biosynthesis of cytokinins, was coupled to the heat-inducible hsp70 promoter from Drosophila melanogaster. The influence of the hormonal changes involved was examined as well as the effects of the in vitro growth conditions used for selecting **transformed** plants and the heat treatment to induce **ipt**-gene **expression**. The phenotype of the plants was determined by the tissue sensitivity to three factors: (1) heat treatment reduces stem elongation and diameter growth; (2) in vitro pre-cultivation also reduces stem elongation; and (3) **expression** of the **ipt**-gene stimulates diameter growth, induces debudding in the axillary shoots and inhibits root development. In addition, axillary bud development indicates that in vitro cultivation, implying a stress condition, affects hsp70-**ipt** gene **expression** . 26 ref.

5/3,AB/100 (Item 26 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02898514 CAB Accession Number: 941608524
Attempts to elucidate the molecular mechanism of genetic tumors in Nicotiana.
Feng, X. H.; Kung, S. D.
Center for Agricultural Biotechnology and Department of Botany, University of Maryland, College Park, MD 20742, USA.
Institute of Botany, Academia Sinica Monograph Series (No. 13): p.35-46
Publication Year: 1993
ISSN: 0258-5170 --
Language: English
Document Type: Journal article
The tumorous amphidiploid hybrid (GGLL wild type) of N. glauca x N. langsdorffii, a non-tumorous mutant (GGLL mutant), and the parental species were used to study the molecular and physiological mechanisms underlying spontaneous genetic tumorigenesis. Endogenous levels of cytokinins in various tissues of all 4 genotypes were measured in immunoassays. Tumours contained relatively higher level of cytokinin than other tissues. The non-tumorous mutant exhibited a shooty morphology, indistinguishable from that of wild type genetic tumours, when it was treated by exogenously-applied cytokinins or **transformed** with an Agrobacterium tumefaciens Ti T-DNA gene (**ipt**) encoding isopentenyltransferase, an enzyme involved in the biosynthesis of cytokinin. This altered phenotype of the **transformed** mutant was

caused by an elevation in the level of cytokinin resulting from the constitutive **expression** of the **ipt** gene. The spatial and temporal regulation of the Ng rol (N. glauca genomic genes homologous to the A. rhizogenes Ri rol genes) gene **expression** was also examined in genetic tumors. The **expression** of Ng rolC was higher in tumours than in normal tissues, suggesting that Ng rolC, which may have a similar function as Ri rolC to release free cytokinins from their conjugated forms, might play an important role in genetic tumour formation and/or maintenance. In conclusion, it seems that genetic tumours were caused, at least in part, by elevated levels of free cytokinin in interspecific hybrids. Furthermore, to identify other regulators of tumour induction and growth, PCR (polymerase chain reaction) was used to isolate protein kinase sequences from Nicotiana. RNA blot analyses showed that transcripts of 4 isolated kinase genes accumulated differentially during genetic tumour induction. Transcription of one protein kinase, named NIPK2, increased during tumour induction, while other kinase transcripts showed little change during the induction period. Thus, protein kinases may play a very critical regulatory role in plant hormone-mediated genetic tumorigenesis in Nicotiana. 64 ref.

5/3,AB/101 (Item 27 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02776801 CAB Accession Number: 931644425
Morphological characteristics and phytohormone content of **ipt** -transgenic tobacco.
Beinsberger, S. E.; Clijsters, H. M.; Valcke, R. L.; Onckelen, H. van
Department of SBM, Limburgs Universitait Centrum, 3590 Diepenbeek, Belgium.
Conference Title: Progress in plant growth regulation. Proceedings of the 14th International Conference on Plant Growth Substances, Amsterdam, Netherlands, 21-26 July 1991
p.738-745
Publication Year: 1992
Editors: Karssen, C. M.; Loon, L. C. van; Vreugdenhil, D.
Publisher: Kluwer Academic Publishers -- Dordrecht, Netherlands
ISBN: 0-7923-1617-7
Language: English
Document Type: Book chapter
Phytohormone content and morphological characteristics were analysed in plant material derived from Nicotiana tabacum cv. Petit Havana SR1 leaf discs **transformed** with the Agrobacterium tumefaciens T-DNA **ipt** gene using recombinant Ti-plasmids pGV2492 and pGV2488. Data on the cytokinin content and cytokinin : auxin ratio are provided for (1) transgenic calluses; (2) transgenic regenerants; (3) transgenic grafts (with transgenic shoots sandwiched in a vertical incision of a decapitated untransformed tobacco plant) and (4) transgenic seedlings. 7 ref.

5/3,AB/102 (Item 28 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02776478 CAB Accession Number: 931644084
Transgenic plants and transgenic plant mosaics for the **expression** of pathogen derived genes able to affect phytohormone activity.
Spena, A.; Estruch, J. J.; Aalen, R. D.; Prinsen, E.; Parets-Soler, A.; Nacken, W.; Sommer, H.; Chriqui, D.; Grossmann, K.; Onckelen, H. van; Schell, J.
Max-Planck-Institut fur Zuchtungsforschung, 5000 Koln 30, Germany.
Conference Title: Progress in plant growth regulation. Proceedings of the 14th International Conference on Plant Growth Substances, Amsterdam,

Netherlands, 21-26 July 1991
p.724-730
Publication Year: 1992
Editors: Karssen, C. M.; Loon, L. C. van; Vreugdenhil, D.
Publisher: Kluwer Academic Publishers -- Dordrecht, Netherlands
ISBN: 0-7923-1617-7
Language: English
Document Type: Book chapter
Information on phytohormone activity in genetically engineered plants containing pathogen derived genes is collated on the basis of studies on (1) genetic mosaics for cytokinin synthesis (**ipt** gene from Agrobacterium tumefaciens), (2) genetic mosaic for the **expression** of the rolC gene of A. rhizogenes, (3) plants transgenic for the IAA lysine synthetase (iaaL) gene of Pseudomonas savastanoi, and (4) plants transgenic for tapetum specific **expression** of the rolB gene. Most studies were made with tobacco. 14 ref.

5/3,AB/103 (Item 29 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02762279 CAB Accession Number: 931642994
Floral development and **expression** of floral homeotic genes are influenced by cytokinins.
Estruch, J. J.; Granell, A.; Hansen, G.; Prinsen, E.; Redig, P.; Onckelen, H. van; Schwarz-Sommer, Z.; Sommer, H.; Spena, A.
Max-Planck-Institut fur Zuchtungsforschung, Carl-von-Linne-Weg 10, 5000 Koln 30, Germany.
Plant Journal vol. 4 (2): p.379-384
Publication Year: 1993
ISSN: 0960-7412 --
Language: English
Document Type: Journal article
Tobacco plants that are somatic mosaics for the **expression** of a cytokinin-synthesizing gene (**isopentenyl transferase**) have viviparous leaves and were obtained by inserting the maize transposon Ac into the untranslated leader sequence of the 35S-**ipt** gene. Epiphyllous buds can be either vegetative or floral. Floral adventitious buds can be either normal or abnormal. Abnormalities of floral development correlate with: (1) a local activation of the cytokinin-synthesizing gene; (2) a drastic increase in floral cytokinin content; and (3) a decrease in the steady-state levels of mRNA homologues of the homeotic genes DEFA, GLO and PLENA of Antirrhinum majus. Thus, these data show that cytokinins in planta are able to alter the development of floral organs and to decrease the **expression** of 3 homeotic floral genes. Nucleotide sequence data for the tobacco cDNA clone are deposited under EMBL Data Library accession number X67959. 29 ref.

5/3,AB/104 (Item 30 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02762167 CAB Accession Number: 931642872
Modulation of chloroplast gene **expression** in transgenic plants of tobacco following changes in the phytohormone balance.
Yusibov, V. M.; Pak Chun Ir; Andrianov, V. M.; Piruzyan, E. S.
Conference Title: 1 Vsesoyuznyi simpozium "Novye metody biotekhnologii rastenii", Pushchino, 20-22 noyabrya, 1991: Tezisy dokladov.
p.50-51, 152-153
Publication Year: 1991
Publisher: -- Pushchino, Russia
Language: English; Russian

Document Type: Miscellaneous
Transgenic plants of 2 types were produced: containing the Escherichia coli glucose-6-phosphate isomerase gene xyl and the cytokinin synthesis gene **ipt** from Agrobacterium tumefaciens Ti-plasmid T-DNA. Analysis of plants of both types showed an increase in the content of cytokinins. Northern blot hybridization, which was used to assess accumulation of mRNA of the rbcL gene coding for the large subunit of ribulose-bisphosphate carboxylase, showed an increased content of this mRNA both in the transgenic plants and after treatment with exogenous cytokinin. Changes in the content of mRNAs of some other chloroplast genes in the transgenic plants were studied, e.g. psbA, proB, several ndh genes and the gene for 23S rRNA.

5/3,AB/105 (Item 31 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02708928 CAB Accession Number: 931638660
Viviparous leaves produced by somatic activation of an inactive cytokinin-synthesizing gene.
Estruch, J. J.; Prinsen, E.; Onckelen, H. van
MPI fur Zuchtungsforshchung, Carl-von-Linne Weg 10, W-5006 Koln 30, Germany.
Science (Washington) vol. 254 (5036): p.1364-1367
Publication Year: 1991
ISSN: 0036-8075 --
Language: English
Document Type: Journal article
A chimaeric gene consisting of the CaMV 35S promoter and the **isopentenyl transferase** (**ipt**) gene of Agrobacterium tumefaciens, split by the Activator element of maize, was introduced into tobacco. Tobacco plants that are somatic mosaics for **expression** of a cytokinin-synthesizing **ipt** gene have viviparous leaves. Such a formation of shoots in an abnormal position represents a significant deviation from the usual organization of the plant body where a central axis produces shoots only in the axils of lateral leaf appendages and according to a precise phyllotactic pattern. This report links vivipary to the **expression** of a gene whose product is involved in the synthesis of the phytohormone cytokinin. 27 ref.

5/3,AB/106 (Item 32 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02672220 CAB Accession Number: 931636795
On microbes and plants: new insights into phytohormonal research.
Spena, A.; Estruch, J. J.; Schell, J.
Max-Planck-Institut fur Zuchtungsforschung, Carl-von-Linne Weg 10, 5000 Koln 30, Germany.
Current Opinion in Biotechnology vol. 3 (2): p.159-163
Publication Year: 1992
ISSN: 0958-1669 --
Language: English
Document Type: Journal article
Alterations to the biological activities of phytohormones can result in modifications of plant physiological and developmental processes. Microbial organisms that are pathogens or symbionts of plants are natural models for studying such modifications. Several genes of bacterial origin able to alter phytohormone content and activity in plants have been characterized, including genes whose products can synthesize and modify phytohormones and/or hydrolyse phytohormone conjugates. Their **expression** in transgenic plants has confirmed that several

morphological and physiological traits can be altered simultaneously by the **expression** of a single gene. This approach has been shown to be of value not only in achieving a better understanding of the fundamental mechanisms underlying growth and development in plants, but also in attaining agriculturally important goals, such as the control of ripening. The genes for isopentenyltransferase (**ipt**) and IAA synthase (iaa M and iaaH) of Agrobacterium tumefaciens, the rolB gene of A. tumefaciens (encoding a beta -glucosidase), the IAA-lysine synthetase (iaaL) gene of Pseudomonas syringae subsp. savastonoi and several plant genes encoding ACC synthase and ACC oxidase are considered, especially their **expression** in transgenic plants. 48 ref.

5/3,AB/107 (Item 33 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02660069 CAB Accession Number: 931636381
Chimaeras and transgenic plant mosaics: a new tool in plant biology.
Spena, A.; Schulze, S. C.
Max-Planck-Institut fur Zuchtungsforschung, Carl-von-Linne Weg 10, 5000 Koln 30, Germany.
Conference Title: Advances in molecular genetics of plant-microbe interactions. Volume I. Proceedings of the 5th International Symposium, Interlaken, Switzerland, 9-14 September 1990
p.352-356
Publication Year: 1991
Editors: Hennecke, H.; Verma, D. P. S.
Publisher: Kluwer Academic Publishers -- Dordrecht, Netherlands
ISBN: 0-7923-1082-9
Language: English
Document Type: Conference paper
Chimaerism was studied at the level of gene constructs. Results are presented of experiments which have shown that (1) **expression** of the IAA lysine synthetase (iaal) gene of Pseudomonas syringae subsp. savastanoi under the control of the CaMV 35S promoter causes morphological alterations in transgenic tobacco plants; and (2) **expression** of the **ipt** gene of Agrobacterium tumefaciens under the control of the CaMV 35S promoter in Nicotiana tabacum, N. rustica and N. plumbaginifolia prevents in vitro plant regeneration, but when the gene construct is split by a maize transposable element (Ac) in vitro response is restored. 15 ref.

5/3,AB/108 (Item 34 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02606870 CAB Accession Number: 921632055
Progress in cytokinin research.
Kaminek, M.
Institute of Experimental Botany, Czechoslovak Academy of Sciences, 16630 Prague 6, Czechoslovakia.
Trends in Biotechnology vol. 10 (5): p.159-164
Publication Year: 1992
ISSN: 0167-7799 --
Language: English
Document Type: Journal article
The subject is reviewed under the headings; biological effects of cytokinins, how cytokinins originate, tRNA as a source of free cytokinins, metabolism of cytokinins (cytokinin conjugates and cytokinin oxidase), production of cytokinins in transgenic plants, reducing the cytokinin content of plant cells, habituation, how cytokinins act in plant cells, production of secondary metabolites in **transformed** plants, and

outlook for the future. The potential is highlighted for using cytokinin genes in transgenic plants to increase yield by **expression** post anthesis. The Agrobacterium tumefaciens **ipt** gene has been **expressed** in transgenic tobacco and Arabidopsis plants in response to stimulation of a heat shock promoter. Antisense **ipt** genes might be used to reduce levels of cytokinin relative to auxin, thus stimulating rooting and reduction of branching in some ornamental and forest trees. Key future targets are cloning the genes regulating cytokinin mobilization, degradation and inactivation, and cytokinin binding sites. 42 ref.

5/3,AB/109 (Item 35 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02340446 CAB Accession Number: 902303196
Full **expression** of chimeric T-DNA gene 4 constructions in tobacco tissues.
Beinsberger, S. E.; Rudelsheim, P.; Inze, D.; Lijsebettens, M. van; Greef, J. de; Onckelen, H. A. van
Dep. Biology, University of Antwerp, UIA, B-2610 Wilrijk, Belgium.
Archives Internationales de Physiologie et de Biochimie vol. 96 (1): p.PP 2
Publication Year: 1988 --
Language: English
Document Type: Conference paper; Journal article
This paper was presented at a meeting of the Belgian Association of Plant Physiology at Liege on 14th Nov. 1987. The Agrobacterium tumefaciens T-DNA gene 4 encodes for **isopentenyl-transferase** which catalyses the first step in cytokinin biosynthesis. Chimeric T-DNA gene 4 constructions incorporated in Nicotiana tabacum cv. Petit Havana SR1. in the pGV831 vector were mobilized in A. tumefaciens in the Ti-plasmid vector pGV2260. Since the pGV831 contained a selectable marker (Pnos-nptII) the **transformed** cells could be selected on a kanamycin-containing medium in presence of both auxins and cytokinins so that the activity of different chimeric genes in an identical genetic background could be compared. In the control line, which contained only the selectable marker, very low cytokinin amounts were observed. In tobacco calli containing the octopine (pTi C58)-, the nopaline (pTi B6S3) gene 4 coupled to its own non-light inducible promoter, as well as in calli **transformed** with the chimeric octopine gene 4 coupled to the Pnos promoter, an increase of the endogenous levels of both cytokinins and IAA was observed. Consequently all gene 4-containing tissues managed to survive on a phytohormone-deficient medium. Surprisingly low endogenous cytokinin levels were found in light-grown calli containing a chimeric gene 4 construct coupled to the light-inducible Pssu promoter. Growth experiments on phytohormone-deficient media, however, showed that in the light some of the Pssu-gene 4 lines survived whereas in the dark the same lines turned brown and died. 6 ref.

5/3,AB/110 (Item 36 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02335370 CAB Accession Number: 901617500
Dual promoter of Agrobacterium tumefaciens mannopine synthase genes is regulated by plant growth hormones.
Langridge, W. H. R.; Fitzgerald, K. J.; Koncz, C.; Schell, J.; Szalay, A. A.
Plant Molecular Genetics, University of Alberta, Medical Sciences Building, Edmonton, AB T6G 2P5, Canada.
Proceedings of the National Academy of Sciences of the United States of

America vol. 86 (9): p.3219-3223
Publication Year: 1989
ISSN: 0027-8424 --
Language: English
Document Type: Journal article
Temporal and spatial distribution of mannopine synthase (mas) promoter activity was determined throughout the development of transgenic tobacco plants using bacterial luciferase luxA and luxB as reporter genes. Luciferase activity was determined by luminometry in vitro and visualized by computer-enhanced single-photon video imaging in vivo. The activity of the mas dual promoters increased basipetally in developing plants and was wound-inducible in leaf and stem tissue. Hormone bioassays with isolated plant tissues and tumours deficient in the transferred DNA (T-DNA)-encoded genes iaaM, iaaH and **ipt** indicated that activity of the mas dual promoters is regulated by auxin and enhanced by cytokinin in both differentiated and tumorous plant cells. 33 ref.

5/3,AB/111 (Item 37 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02309237 CAB Accession Number: 901615588
Agrobacterium-mediated **transformation** of the cultivated strawberry (Fragaria x ananassa Duch.) using disarmed binary vectors.
James, D. J.; Passey, A. J.; Barbara, D. J.
Institute of Horticultural Research, East Malling, Maidstone, Kent, ME19 6BJ, UK.
Plant Science (Limerick) vol. 69 (1): p.79-94
Publication Year: 1990
ISSN: 0168-9452 --
Language: English
Document Type: Journal article
Two disarmed Ti-binary vectors of A. tumefaciens were used to produce viable transgenic strawberry plants. Fertile strawberry plants with a normal phenotype were regenerated after **transformation** with pBIN6, which carries genes for nopaline synthase (nos) and neomycin phosphotransferase (nptII) (conferring kanamycin resistance). The transfer and **expression** of the 2 genes was confirmed by Southern blot analysis, the detection of nopaline synthase activity in vegetative and reproductive tissues and rooting in vitro in the presence of kanamycin. The nos gene continued to be **expressed** in greenhouse-grown plants many months after removal from in vitro growth conditions. After selfing the R0 plants, nos segregated in the R1 progeny according to a 3 : 1 Mendelian ratio. In in vitro germinated seedlings there was complete correlation between the presence of nopaline synthase activity and the ability of leaf segments to produce callus on a medium containing kanamycin. Transgenic clones that exhibited an abnormal phenotype associated with cytokinin overproduction were produced when plants were **transformed** with pSS1, a derivative of pBIN19 carrying both nptII and **ipt** (encoding isopentenyltransferase). Shoots of these clones grew on hormone-free medium, could not be induced to root and their growth was unaffected by the presence of 50 micro g/ml kanamycin in hormone-free media. 36 ref.

5/3,AB/112 (Item 38 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02147694 CAB Accession Number: 891607282
Construction of a heat-inducible chimaeric gene to increase the cytokinin content in transgenic plant tissue.
Schmulling, T.; Beinsberger, S.; Greef, J. de; Schell, J.; Onckelen, H.

van; Spena, A.
MPI fur Zuchtungsforschung, 5000 Koln 30, German Federal Republic.
FEBS Letters vol. 249 (2): p.401-406
Publication Year: 1989
ISSN: 0014-5793 --
Language: English
Document Type: Journal article
The **ipt** gene of Agrobacterium tumefaciens T-DNA encodes an isopentenyltransferase which causes cytokinin overproduction and developmental alterations in **transformed** plants. A chimaeric gene, constructed by positioning the **ipt** coding region under the control of the hsp70 gene from Drosophila melanogaster, allowed heat-regulated **expression** in transgenic plant tissue. Heat-shock treatment of tobacco calluses transgenic for the chimaeric hsipt gene increased the endogenous cytokinin concentration and enabled the calluses to grow on cytokinin-free medium. Transgenic plants regenerated from calluses **transformed** with the hsipt gene and grown at normal temperatue were phenotypically normal. 21 ref.

5/3,AB/113 (Item 39 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02113745 CAB Accession Number: 891676284
Rapid induction of genomic demethylation and T-DNA gene **expression** in plant cells by 5-azacytosine derivatives.
Klaas, M.; John, M. C.; Crowell, D. N.; Amasino, R. M.
Dep. Biochem., Coll. Agric. & Life Sci., Univ. Wisconsin, Madison, WI 53706, USA.
Plant Molecular Biology vol. 12 (4): p.413-423
Publication Year: 1989
ISSN: 0167-4412 --
Language: English
Document Type: Journal article
Using a clonal tobacco/Agrobacterium tumefaciens tumour line, plant E, that contained a silent T-DNA insert and required phytohormones for callus growth in culture, the conditions for demethylation of the tobacco genome and induction of the silent, hypermethylated T-DNA gene (**ipt**) by 5-azacytosine (5-azaCyt) derivatives in a cell suspension culture were determined. In the system described, 5-azacytidine (5-azaC) was more effective in causing genomic demethylation and **ipt** gene induction than 5-azaCyt or 5-azadeoxycytidine. A single treatment with 2.5 micro M 5-azaC resulted in a maximal level of **ipt** gene induction without inhibiting cell growth. However, the level of genomic methylation could not be reduced below approximately two thirds of that found in untreated controls, even after extensive 5-azaC treatment. Furthermore, remethylation of the genome occurred after removal of 5-azaC. The use of 5-azaC as an inducer of silent plant genes is examined, together with differences in the response of plant and animal genomes to demethylating agents. 29 ref.

5/3,AB/114 (Item 40 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02113494 CAB Accession Number: 891605208
Alterations of endogenous cytokinins in transgenic plants using a chimeric **isopentenyl transferase** gene.
Medford, J. I.; Horgan, R.; El-Sawi, Z.; Klee, H. J.
Pl. Molec. Biol. Group, Monsanto Co., 700 Chesterfield Village Parkway, St. Louis, MO 63198, USA.
Plant Cell vol. 1 (4): p.403-413

Publication Year: 1989
ISSN: 1040-4651 --
Language: English
Document Type: Journal article

Cytokinins appear to play an important role in the processes of plant development. The Agrobacterium tumefaciens **isopentenyl transferase** gene was placed under the control of a heat-inducible promoter (maize hsp70). The chimaeric gene was transferred to tobacco and Arabidopsis plants. Heat induction of transgenic plants caused the **isopentenyl transferase** mRNA to accumulate and increased the level of zeatin 52-fold, zeatin riboside 23-fold and zeatin riboside 5'-monophosphate 2-fold. At the control temperature zeatin riboside and zeatin riboside 5'-monophosphate accumulated in transgenic plants to levels 3 and 7 times, respectively, over levels in wild-type plants. This uninduced cytokinin increase affected various aspects of development. In tobacco these effects included release of axillary buds, reduced stem and leaf area and an underdeveloped root system. In Arabidopsis reduction of root growth was also found. However, neither tobacco nor Arabidopsis transgenic plants showed any differences relative to wild-type plants in time of flowering. Unexpectedly, heat induction of cytokinins in transgenic plants produced no changes beyond those seen in the uninduced state. The lack of effect from heat-induced increases could be a result of the transient increases in cytokinin levels, direct or indirect induction of negating factor(s), or lack of a corresponding level of competent cellular factors. Overall, the effects of the increased levels of endogenous cytokinins in non-heat-shocked transgenic plants seemed to be confined to aspects of growth rather than differentiation. Since no alterations in the programmed differentiation pattern were found with increased cytokinin levels, it is thought that this process may be controlled by components other than absolute cytokinin levels. 36 ref.

5/3,AB/115 (Item 41 from file: 50)
DIALOG(R)File 50:CAB Abstracts

02016733 CAB Accession Number: 881673565

Cytokinin gene fused with a strong promoter enhances shoot organogenesis and zeatin levels in **transformed** plant cells.

Smigocki, A. C.; Owens, L. D.
Tissue Culture & Molec. Biol. Lab., ARS, USDA, Beltsville, MD 20705, USA.

Proceedings of the National Academy of Sciences of the United States of America vol. 85 (14): p.5131-5135
Publication Year: 1988
ISSN: 0027-8424 --
Language: English
Document Type: Journal article

The isopentenyltransferase (**ipt**) gene associated with cytokinin biosynthesis in plants was cloned from a tumour-inducing plasmid carried by Agrobacterium tumefaciens and placed under the control of promoters of differing activities, the cauliflower mosaic virus 35S promoter and the nopaline synthase promoter. These promoter-gene constructs were introduced into wounded Nicotiana (N. tabacum, N. rustica and N. plumbaginifolia) stems and leaf pieces and cucumber seedlings by A. tumefaciens infection. Shoots were observed at the infection site on all Nicotiana plants (except those of N. rustica) infected with the 35S promoter construct (35S-**ipt**), whereas only 41% responded similarly to infection with the unmodified gene. Furthermore, shoots were observed 19 days after infection with the 35S-**ipt** and were up to 6 times taller than shoots induced by the native gene. On cucumber, shoots were observed only on galls incited by the 35S-**ipt** construct. These galls were, on average, 7.5 times larger than those incited by the nopaline synthase promoter construct (NOS-**ipt**) or the unmodified **ipt** gene. Zeatin and

zeatinriboside concentrations, were on average, 23 times higher in 35S-**ipt transformed** shoots than in ones **transformed** with the native **ipt** gene. The results suggested that a more active promoter on the **ipt** gene can enhance or change the morphogenic potential of **transformed** plant cells by increasing their endogenous cytokinin levels. 41 ref.

5/3,AB/116 (Item 1 from file: 144)
DIALOG(R)File 144:Pascal

14473306 PASCAL No.: 00-0134335
Etude d'un oncogene de la souche AB2/73 d'Agrobacterium tumefaciens
(Study of an oncogene from Agrobacterium tumefaciens strain AB2/73)
SCHMIDT Julien; OTTEN Leon, dir
Universite de Strasbourg 1, Strasbourg, Francee
Univ.: Universite de Strasbourg 1. Strasbourg. FRA Degree: Th. doct.
1999-12; **1999** 113 p.
Language: French Summary Language: French; English

AB2/73 est une souche d'Agrobacterium tumefaciens a spectre d'hote limite. Nous avons isole et sequence un ADN-T d'AB2/73. Il porte le gene lso qui induit des tumeurs non differenciees sur certains hotes ainsi que des cals sur des fragments de feuilles de Nicotiana rustica en l'absence d'hormones. La proteine Lso est faiblement homologue a d'autres oncoproteines d'Agrobacterium qui forment la famille rolB. Des co-infections ont ete realisees en utilisant une souche d'Agrobacterium portant le gene lso et une deuxieme souche portant soit une construction iaaM/iaaH soit une construction **ipt**. La presence du gene lso permet d'augmenter la taille de la tumeur induite par certains genes **ipt**. A l'inverse de lignees de cellules de tabac BY2 controle, des lignees portant le gene lso se sont revelees capable d'augmenter leur masse de la meme facon dans un milieu avec ou sans auxine. Cependant les cellules lso se divisent moins bien que les cellules controle en l'absence d'auxine. Des plants de Nicotiana tabacum **transformes** avec le gene lso presentent un phenotype en feuilles gaufrees, leur croissance est plus lente et la taille de leurs racines plus reduite que chez des plantes controle. Ces effets du gene lso font penser a une implication du gene dans le metabolisme de l'auxine, soit en abaissant sa perception par les cellules, soit en augmentant la perception des cytokinines dont les effets viendraient contrecarrer ceux de l'auxine, a moins qu'ils ne se situent a un autre niveau du metabolisme. Des greffes entre tabacs portant le gene lso et controle ont montre que les facteurs induits par la proteine Lso ne diffusent pas a l'echelle de la plante. L'etude de la partie gauche de l'ADN-T de la souche d'Agrobacterium tumefaciens C58 a permis d'ajouter les genes b, c' et d a la famille rolB. Ils ont ete testes conjointement avec les genes e, rolB, 3', 5, orf13 et lso pour leur capacite d'induire la croissance de cellules de feuilles de N. rustica et N. tabacum. La region vir de la souche AB2/73 a ete sequencee. Elle differe peu de celles de souches d'Agrobacterium a spectre d'hote large, sauf pour quelques genes dont virA et virE. L'influence du gene virA sur le spectre d'hote limite de cette souche a ete etudiee par des experiences de complementation. Les autres facteurs pouvant influencer le spectre d'hote sont discutes.

5/3,AB/117 (Item 2 from file: 144)
DIALOG(R)File 144:Pascal

12316704 PASCAL No.: 95-0554472
Expression of a wound-inductible cytokinin biosynthesis gene in transgenic tobacco : correlation of root **expression** with induction of

cytokinin effects
SMIGOCKI A C
ARS, plant molecular biology lab., Beltsville MD 20705, USA
Journal: Plant science : (Limerick), **1995**, 109 (2) 153-163
Language: English
The Agrobacterium-derived cytokinin-biosynthesis gene **ipt** was fused to the wound-inducible proteinase-inhibitor-IIK gene promoter from potato and introduced into Nicotiana plumbaginifolia and N. tabacum. Maximum accumulation of **ipt** transcripts in the leaves of transgenic plants was observed within 3-24 h after leaf wounding. Root and stem **ipt** messages were not detected in unwounded transgenic N. plumbaginifolia PI-II-**ipt** seedlings until after the plants bolted whereas in N. tabacum, a relatively low level of root and stem **expression** was evident only prior to stem elongation and not detected after the plants bolted. Atypical cytokinin effects were observed with the N. plumbaginifolia but not N. tabacum **transformants** . Transgenic N. plumbaginifolia plants bolted sooner, were taller than control plants and had larger leaves with lower specific fresh weights and chlorophyll content. At flowering, the emergence of numerous lateral shoots from lower stem sections and basal leaf greening followed the moderate increase in root **ipt** transcripts and corresponded to a greater than 100-fold increase in zeatin and zeatinriboside cytokinin concentrations. The **expression** pattern of the PI-II-**ipt** gene followed that of the PI-IIK gene and, when **expressed** in the root, corresponded with induction of characteristic cytokinin effects.

5/3,AB/118 (Item 3 from file: 144)
DIALOG(R)File 144:Pascal

12231458 PASCAL No.: 95-0455209
Effect of auxin on **expression** of the **isopentenyl transferase** gene (**ipt**) in **transformed** bean (Phaseolus vulgaris L.) single-cell clones induced by Agrobacterium tumefaciens C58
JAI YOUNG SONG; EUN YEUNG CHOI; HYEUN SE LEE; DONG-WOOG CHOI; MAN-HO OH; SANG-GU KIM
Seoul national univ., dep. biology and res. cent. cell differentiation, Seoul 151-742, Republic of Korea
Journal: Journal of plant physiology, **1995**, 146 (1-2) 148-154
Language: English
The effect of auxin on the endogenous cytokinin content and on the **expression** of **isopentenyl transferase** gene (**ipt**) was investigated in bean (Phaseolus vulgaris L. cv. Palgong) tumor single-cell clones induced by Agrobacterium tumefaciens C58. The major endogenous cytokinins of tumor single-cell clones were zeatin and zeatin riboside. Endogenous zeatin and zeatin riboside levels in tumor single-cell clones cultured on an auxin-supplemented medium were reduced by six-fold and eight-fold, respectively, while tumor single-cell clones cultured on the 5.0 mu M kinetin-supplemented medium did not exhibit any reduction in the levels of these cytokinins. The mRNAs isolated from normal single-cell clones cultured on 5.0 mu M kinetin and 2.5 mu M picloram-supplemented medium, from **transformed** single-cell clones cultured on hormone-free medium, and from **transformed** single-cell clones cultured on 2.5 mu M picloram-supplemented medium, were subjected to Northern blot hybridization. The **ipt** transcript was not detected in tumor single-cell clones cultured on picloram-supplemented medium, but the **ipt** mRNA was detected in tumor single-cell clones cultured on hormone-free medium. The amount of **ipt** mRNA in tumor single-cell clones was found to decrease with time in cultures grown on picloram-supplemented medium. The nopaline synthase gene (nos) transcript was detected in the tumor single-cell clones from both culture conditions. It is concluded that picloram regulates the **ipt** mRNA steady state level, either at the transcriptional level or by affecting **ipt** mRNA

stability.

5/3,AB/119 (Item 4 from file: 144)
DIALOG(R)File 144:Pascal

11737745 PASCAL No.: 94-0605454
Transgenic tobacco plants that overproduce cytokinins show increased tolerance to exogenous auxin and auxin transport inhibitors
YI LI; XIANGYANG SHI; STRABALA T J; HAGEN G; GUILFOYLE T J
Univ. Missouri, dep. biochemistry, Columbia MO 65211, USA
Journal: Plant science : (Limerick), **1994**, 100 (1) 9-14
Language: English
Transgenic tobacco plants **expressing** the Agrobacterium tumefaciens cytokinin biosynthetic **ipt** gene under the control of an auxin-inducible SAUR (Small Auxin-Up RNA) gene promoter were used to study interactions between exogenously applied auxins or auxin transport inhibitors and endogenously produced cytokinins. The transgenic plants used in this study had cytokinin levels about 10-fold higher than non-**transformed** tobacco plants. In aseptic culture, the transgenic tobacco plants exhibited increased tolerance to the toxic effects of high concentrations of exogenously applied auxins. This tolerance is exemplified by increased plant height and fresh weight in transgenic plants treated with auxin compared to similarly treated non-**transformed** plants

5/3,AB/120 (Item 5 from file: 144)
DIALOG(R)File 144:Pascal

10505359 PASCAL No.: 93-0014610
Altered morphology in transgenic tobacco plants that overproduce cytokinins in specific tissues and organs
YI LI; HAGEN G; GUILFOYLE T J
Univ. Missouri, dep. biochemistry, Columbia MO 65211, USA
Journal: Developmental biology, **1992**, 153 (2) 386-395
Language: English
An auxin-inducible bidirectional promoter from the soybean SAUR gene locus was fused to a reporter gene in one direction and a cytokinin biosynthetic gene in the opposite direction and the **expression** of these fused genes was examined in transgenic tobacco. The Escherichia coli uidA gene, which encodes the enzymes beta -glucuronidase (GUS), was used as the reporter gene and the Agrobacterium tumefaciens **ipt** gene, which encodes the enzyme **isopentenyl transferase**, was used as the cytokinin biosynthetic gene

5/3,AB/121 (Item 6 from file: 144)
DIALOG(R)File 144:Pascal

09234991 PASCAL No.: 91-0025367
Restoration of shooty morphology of a nontumorous mutant of Nicotiana glauca X N. Langsdorffii by cytokinin and the isopentenyltransferase gene
XIN-HUA FENG; DUBER S K; BOTTINO P J; SHAIN-DOW KUNG
Univ. Maryland, cent. agricultural biotechonology, College Park MD 20742, USA
Journal: Plant molecular biology, **1990**, 15 (3) 407-420
Language: English
The aim of this study was to test the hypothesis that the production of excess cytokinin was intimately linked to tumorous growth. The shooty morphology of a nontumorous amphidiploid mutant of Nicotiana glauca x N. langsdorffii was restored by cytokinins, whether exogenously applied or

system with a tRNA-isopentenyltransferase selectable marker and excision by homologous recombination (conference abstract)
AUTHOR: Sugita K; Yamakado M; Ebinuma H
CORPORATE AFFILIATE: Nippon-Paper-Ind.
CORPORATE SOURCE: Central Research Laboratory, Nippon Paper Industries, Co., Ltd., 5-21-1, Oji, Kita-ku, Tokyo 114, Japan.
JOURNAL: Plant Physiol. (111, 2, Suppl., 165) **1996**
ISSN: 0032-0889 CODEN: PLPHAY
CONFERENCE PROCEEDINGS: Plant Biology '96; 1996 Annual Meeting of the American Society of Plant Physiologists, San Antonio, TX, 27 July-2 August, 1996.
LANGUAGE: English
ABSTRACT: A new **transformation** method, multi-auto-**transformation** (MAT) vector system, was developed. MAT-vectors contained a chimeric 35S-**ipt** gene (tRNA-isopentenyltransferase (EC-2.5.1.8) cytokinin biosynthesis gene) used as the selectable marker. Transgenic shoots were identified as ESP (extreme shooty phenotype) without apical dominance. A site-specific-recombination system (plasmid pSR1) of Zygosaccharomyces rouxii was used in the MAT-vector system (plasmid pNPI132) to remove the **ipt** gene. After selection of transgenic plants, removal of 35S-**ipt** genes was detected by appearance of normal shoots from ESPs. In an evaluation experiment with tobacco (Nicotiana tabacum), 48 ESP lines were selected and cultured. Normal elongated shoots appeared in 10 ESPs after 2 mth, and another 19 lines after 4 mth. Shoots from these 29 lines (60%) were normally elongated and rooted. These individuals were confirmed as marker-free transgenic plants by DNA analysis. The 35S-**ipt** gene was used as a selectable marker to obtain marker free transgenic plants in hybrid aspen (Populus sieboldii x Populus grandidentata). (0 ref)

5/3,AB/128 (Item 7 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0186461 DBR Accession No.: 95-13282
Phenotype modification and enhanced tolerance to insect pests by regulated **expression** of a cytokinin biosynthesis gene - (conference paper)
AUTHOR: Smigocki A C
CORPORATE AFFILIATE: USDA-ARS
CORPORATE SOURCE: Plant Molecular Biology Laboratory, U.S. Department of Agriculture, Agricultural Research Service, Beltsville, MD 20705, USA.
JOURNAL: Hortscience (, 30, 5, 967-69) **1995**
ISSN: 0018-5345 CODEN: HJHSAR
CONFERENCE PROCEEDINGS: American Society for Horticultural Science (ASHS), 91st Annual Meeting, Corvallis, Oregon, 10 August, 1994.
LANGUAGE: English
ABSTRACT: Phenotype modification and enhanced tolerance to insect pests by regulated **expression** of a cytokinin biosynthesis gene are reviewed with respect to: phenotype modification via **expression** of the cytokinin biosynthesis gene (constitutive over-**expression** and transient over-**expression**); cytokinin-induced delay of senescence; and cytokinin involvement in pest and disease-resistance. The tRNA-isopentenyltransferase (EC-2.5.1.8) **ipt** gene from Agrobacterium tumefaciens has been used to induce the biosynthesis of endogenous cytokinins in **transformed** plant cells. The **ipt** gene on the Ti plasmid encodes an enzyme which catalyzes the condensation of AMP and isopentenyl pyrophosphate to form isopentenyl AMP, a precursor of most other cytokinins. Enzymatic activity similar to that encoded by the **ipt** gene has been detected in plant cytokinin biosynthesis. The plant enzyme has only been partially purified and the corresponding plant gene has yet to be identified and cloned. (43 ref)

5/3,AB/129 (Item 8 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0167299 DBR Accession No.: 94-09850
Transgenic peach plants containing a cytokinin biosynthesis gene display altered growth in vitro and under greenhouse conditions - peach transgenic plant construction via **isopentenyl-transferase** **ipt** gene **expression** for increased growth and compact growth habit (conference abstract)
AUTHOR: Hammerschlag F A; Smigocki A C
CORPORATE AFFILIATE: U.S.Dept.Agr.
CORPORATE SOURCE: USDA/ARS, PSI, Plant Molecular Biology Laboratory, Beltsville, MD 20705, USA.
JOURNAL: Hortscience (29, 5, 454) **1994**
CODEN: HJHSAR
LANGUAGE: English
ABSTRACT: Peach (Prunus persica) transgenic plants **transformed** with the **ipt** gene from Agrobacterium tumefaciens strain tms328::transposon Tn5 and containing elevated levels of cytokinins were screened in vitro for compact growth habit on 4 different levels of benzyladenine (BA). After 9 wk in vitro, the average number of axillary shoot per plant for 2 of the **transformants**, 99-1 and 40-1, ranged from 1.5- to 6.6-fold that for the controls on 0-30 uM BA, whereas the average fresh weight ranged from 1.1- to 3.6-fold that for the controls. 1 Of the **transformants**, 94-1, produced a greater number of axillary shoots only on 30 uM BA. Rooted plants derived through propagation from the original **transformants** were monitored for 30 mth in the greenhouse. The average height of **transformants** 94-1 and 99-1 after 6 mth in the greenhouse was 88 and 77% of controls, respectively, and after 30 mth was 90 and 75% of control, respectively. In comparison to controls, **transformants** exhibited a greater number of branches per m per plant after 6 wk, but a reduced number after 30 mth. The introduction of a cytokinin gene may be a useful approach to obtaining peach trees with a compact growth habit. (0 ref)

5/3,AB/130 (Item 9 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0166110 DBR Accession No.: 94-08661
Cloning an **ipt** gene from Agrobacterium tumefaciens: characterization of cytokinins in derivative transgenic plant tissue - increased cytokinin biosynthesis in petunia and Kalanchoe diagermentiana transgenic plant following isopentyltransferase gene **expression** using vector plasmid pMJM
AUTHOR: McKenzie M J; +Jameson P E; Poulter R T M
CORPORATE AFFILIATE: Univ.Otago
CORPORATE SOURCE: Department of Plant Biology and Biotechnology, Massey University, Private Bag 11222, Palmerston North, New Zealand.
JOURNAL: Plant Growth Regul. (14, 3, 217-22) **1994**
CODEN: PGRED3
LANGUAGE: English
ABSTRACT: An isopentyltransferase gene isolated from Agrobacterium tumefaciens AcH5 using the polymerase chain reaction (PCR) was used to **transform** Petunia hybrida cv **Express** Red Star and Kalanchoe diagermentiana (under the regulation of its native promoter). The PCR product was restricted with EcoRI and Asp718 and the major fragment directionally cloned into plasmid pUC19, forming plasmid pNIK. The insert was subsequently re-cloned into a modified plasmid pGA643 binary vector (plasmid pGA643A) in which the HpaI, Asp718 and ClaI sites of

batatas), onion (Allium cepa), garlic (Allium sativum), artichoke (Cynara scolymus) or Dahlia sp. The construct may be contained in a prokaryote and/or eukaryote vector, capable of integration into the genome or autonomous replication, preferably plasmid pCGP275. The **ipt** gene may be developmentally regulated, and under the control of an enhancer. The DNA may be used to produce a transgenic plant with 1 or more of the following properties: increased endogenous cytokinin, tuber number and/or wt., stem diameter, height or leaf size; delayed leaf senescence; or increased leaf photosynthetic capacity, leading to increased tuber load and yield. The transgenic plant is produced by plasmid mobilization in Agrobacterium sp., **transformation**, biolistic microprojectile bombardment, microinjection or electroporation. (36pp)

5/3,AB/133 (Item 12 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0116303 DBR Accession No.: 91-03945 PATENT
Modulating endogenous cytokinin levels - DNA cassette construction for tomato fruit tissue-specific gene **expression** e.g. during ripening; **isopentenyl-transferase** gene cloning and **expression** in transgenic plant; DNA sequence
PATENT ASSIGNEE: Calgene **1991**
PATENT NUMBER: EP 409628 PATENT DATE: 910123 WPI ACCESSION NO.: 91-024190 (9104)
PRIORITY APPLIC. NO.: US 382802 APPLIC. DATE: 890719
NATIONAL APPLIC. NO.: EP 90307925 APPLIC. DATE: 900719
LANGUAGE: English
ABSTRACT: An new **expression** DNA cassette contains (in 5' to 3' direction of transcription): a developmentally regulated transcriptional and translational initiation region; a DNA sequence encoding an enzyme in a cytokinin metabolic pathway, under the transcriptional control of the initiator region; and a transcriptional terminator. At least 1 of the control regions is heterologous to the cytokinin gene. A plant cell containing the DNA cassette, and a method for modification of a plant phenotype using the DNA cassette, are also new. The plant cells are preferably tomato (Lycopersicon esculentum) fruit cells. The cytokinin metabolic pathway is preferably a biosynthetic pathway, and the gene preferably encodes DMA-transferase (**isopentenyl-transferase**). The developmentally regulated initiation region is preferably from a fruit-specific promoter or an ovary tissue promoter, e.g. the 2A11, Z130 or Z70 gene. Using the DNA cassette, fruit development, properties, maturation and ripening may be controlled. Other fruits (berries, drupes, hesperidium, pepos) or legume edible portions may also be modified using the DNA cassette. (38pp)

5/3,AB/134 (Item 13 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0109794 DBR Accession No.: 90-12485
Altering plant morphogenesis by plant genetic engineering - transgenic plant construction; tissue-specific gene **expression**; hairy root culture and propagation (conference paper)
AUTHOR: Scmuelling T; Schell J; Spena A
CORPORATE AFFILIATE: Max-Planck-Inst.Genet.
CORPORATE SOURCE: Max-Planck-Institut fuer Zuechtungsforschung, D-5000 Koeln 30, Germany.
JOURNAL: BIOTEC-90 (131-36) **1990**
CODEN: 9999Y

LANGUAGE: English
ABSTRACT: In vivo genetic manipulation makes it possible to characterize the pleiotropic effects of gene products interacting with normal differentiation mechanisms throughout the life-cycle of a plant, without exogenous plant growth factor application or disrupting the integrity of the plant. Genes which alter plant growth and differentiation may be introduced into the plant gnome and their effects characterized. Exchange of regulatory regions allows altered tissue-specific gene **expression**. Agrobacterium rhizogenes hairy root culture may be grown in vitro on plant growth factor-free culture medium, and plants may be propagated. Rol gene **expression** (rolA, rolB and rolC) in plants from hairy root cultures has been studied in detail, and altered morphogenetic characteristics have been described. The **ipt** gene of Agrobacterium tumefaciens encodes an isopentenyltransferase which causes cytokinin overproduction and developmental alterations in transgenic plants. Better knowledge of regulatory sequences should allow a more accurate targeting of gene **expression** to specific tissues or development stages. (10 ref)

5/3,AB/135 (Item 14 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0091021 DBR Accession No.: 89-09012
Genetic **transformation** of willows (Salix spp.) by Agrobacterium tumefaciens - application to improved propagation of Salix schwerinii, Salix viminalis and Salix dasyclados
AUTHOR: Vahala T; Stabel P; Eriksson T
CORPORATE SOURCE: Department of Physiological Botany, University of Uppsala, Box 540, S-75121 Uppsala, Sweden.
JOURNAL: Plant Cell Rep. (8, 2, 55-58) **1989**
CODEN: PCRPD8
LANGUAGE: English
ABSTRACT: An in vitro **transformation** method has been developed for stem explants of fast-growing willow (Salix spp.) using Agrobacterium tumefaciens. Explants were grown for 1 wk on Murashige and Skoog (MS) medium supplemented with 0.44 uM benzyladenine (BA) and 0.45 uM 2,4-D at 20 deg with a 16 hr photoperiod. Co-cultivation with A. tumefaciens strains C58 and GV3101 was performed for 15 min. Explants were returned to culture medium and incubated for 3 days at 25 deg, before transfer to MS medium supplemented with 500 ug/ml Claforan and one of the following combinations: (a) no hormones (selective medium for C58 **transformants**); (b) no hormones, 100 ug/ml kanamycin (selective for GV3101 **transformants**); or (c) 2.2 uM BA, 2.3 uM 2,4-D (non-selective medium). The explants were cultured at 20 deg under a 16 hr photoperiod. The **expression** of **transformed** T-DNA gene 4 in **transformed** Salix callus was confirmed by nopaline assays, which were performed with callus growing on selective medium. Among the 52 C58 **transformants** and 34 GV3101 **transformants** tested, nopaline-synthase (EC-1.5.1.19) activity was found in 50 and 32 calli, respectively. (28 ref)

5/3,AB/136 (Item 15 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0027957 DBR Accession No.: 84-11232
Identification of a cloned cytokinin biosynthetic gene - isopentenyltransferase encoded by the tmr locus of Agrobacterium tumefaciens Ti T37 plasmid
AUTHOR: Barry G F; Rogers S G; Fraley R T; Brand L
CORPORATE AFFILIATE: Monsanto

CORPORATE SOURCE: Monsanto Company, 800 N. Lindbergh Boulevard, St. Louis, MO 63167, USA.
JOURNAL: Proc.Natl.Acad.Sci.U.S.A. (81, 15, 4776-80) **1984**
CODEN: PNASA6
LANGUAGE: English
ABSTRACT: The nucleotide sequence of the tmr region from the nopaline Ti plasmid pTi T37 of Agrobacterium tumefaciens revealed an open reading frame capable of encoding a 27 kDalton protein. The 1279 bp SalI/HindIII fragment was isolated from plasmid pMON99, which contained the 1983 bp BamHI/HindIII segment of HindIII-22 of pTi T37. The 41 bp MboI/SalI fragment was purified from dam- pMON99 DNA. The isolated fragments were ligated with a synthetic DNA that regenerated the 5' end and inserted into the BamHI/HindIII sites of pKC7. The reconstituted open reading frame was cloned downstream from a trp promoter, and the resulting plasmid, pMON230, was used to **transform** Escherichia coli. The **expression** of a 27 kDalton protein was observed in maxicells from the engineered pTi T37 tmr construct. Strains harboring the recombinant tar plasmid produced the cytokinin biosynthetic enzyme isopentyltransferase, an enzyme not normally found in E.coli. It is proposed that the tumor locus be renamed **ipt** now that this specific function has been assigned to the gene product. (43 ref)

endogenously produced by **transformation** of the mutant with a transfer DNA (T-DNA) cytokinin-biosynthesis gene (isopentenyltransferase; **ipt**). Auxins alone did not confer this effect.

5/3,AB/122 (Item 1 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0242694 DBR Accession No.: 1999-13459 PATENT
Selection of transgenic plants using a silent promoter - tobacco transgenic plant construction via vector plasmid-mediated isopentenyltransferase or luciferase gene transfer and **expression** in Agrobacterium tumefaciens
AUTHOR: Chua N H; Aoyama T
CORPORATE SOURCE: New York, NY, USA.
PATENT ASSIGNEE: Univ.New York-Rockefeller **1999**
PATENT NUMBER: WO 9938988 PATENT DATE: 19990805 WPI ACCESSION NO.: 1999-469335 (1939)
PRIORITY APPLIC. NO.: US 14592 APPLIC. DATE: 19980128
NATIONAL APPLIC. NO.: WO 99US1629 APPLIC. DATE: 19990127
LANGUAGE: English
ABSTRACT: A method for the selection of transgenic plants (I) which involves a silent selectable marker consists of **transforming** a plant cell with a vector containing an isopentenyltransferase (**ipt**) gene, a CKI gene or a gene from the knotted family, growing the plants in the absence of a plant growth factor, but in the presence of an inducer and then excising the shoots which develop, is new. Also claimed is a second method for making transgenic plants which display a fluorescent design or words which consists of constructing a transgenic plant with a vector containing a luciferase gene under the control of a chemically inducible promoter and placing a chemical which induces the promoter onto the plant, in the pattern of the design or words desired. The new method may be useful for producing transgenic plants with silent markers which are not constitutively **expressed**. In an example, a vector plasmid similar to pBI101, which additionally contained an **ipt** gene downstream of a 6 x UAS promoter and a glucocorticoid receptor hormone binding domain, was introduced into Agrobacterium tumefaciens. The **transformed** cells were then used to **transform** tobacco (Nicotiana tabacum) cell. (39pp)

5/3,AB/123 (Item 2 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0232193 DBR Accession No.: 99-02294 PATENT
A new construct to **express** phytohormones in developing fruit - transgenic plant construction via Agrobacterium tumefaciens-mediated **isopentenyl-transferase** and tryptophan-2,3-dioxygenase gene transfer and **expression**
AUTHOR: Li Y
CORPORATE SOURCE: Manhattan, KS, USA.
PATENT ASSIGNEE: Univ.Kansas-State-Res.Found. **1998**
PATENT NUMBER: WO 9849888 PATENT DATE: 981112 WPI ACCESSION NO.: 99-034673 (9903)
PRIORITY APPLIC. NO.: US 45725 APPLIC. DATE: 970506
NATIONAL APPLIC. NO.: WO 98US9013 APPLIC. DATE: 980506
LANGUAGE: English
ABSTRACT: A DNA construct containing either an **isopentenyl-transferase** (734 amino acids) or a tryptophan-2,3-dioxygenase (EC-1.13.11.11) (241 amino acids) operably linked to an ovary or developing fruit-specific plant-**expressible** promoter (e.g GH3 (749 bp), AGL (1,051 bp) or PLE36 promoter) is new. Also claimed: an

Agrobacterium tumefaciens LBA 4404-**transformed** transgenic plant e.g. tomato (Lycopersicon esculentum), cucumber (Cucumis sativus), watermelon (Citrullus lanatus), tobacco (Nicotiana tabacum), apple (Malus sp.), citrus, pear (Pyrus domestica), fig (Ficus carica), currant, muskmelon, squash, cherry (Prunus sp.), sweet potato (Ipomoea batatas), grapevine (Vitis vinifera), sugarbeet (Beta vulgaris), tea (Camellia sinensis), strawberry (Fragaria sp.), blackberry (Rubus ulmifolius), blueberry (Vaccinium sp.), raspberry (Rubus idaeus), loganberry, rose (Rosa sp.), chrysanthemum, or aubergine (Solanum melongena); a method for producing the transgenic plant; and a transgenic seed/embryo. The construct is used to integrate cytokinin/auxin biosynthesis enzymes, to produce seedless fruit in the absence of pollination. (27pp)

5/3,AB/124 (Item 3 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0230367 DBR Accession No.: 99-00468 PATENT
New DNA encoding sodium-dependent phosphate transporter protein **IPT**-1 - vector **expression** in host cell, agonist, antagonist e.g. antisense sequence and antibody, used for kidney disease or cancer diagnosis, therapy, gene therapy or drug screening
AUTHOR: Feild J
CORPORATE SOURCE: Philadelphia, PA, USA.
PATENT ASSIGNEE: SK-Beecham **1998**
PATENT NUMBER: EP 875569 PATENT DATE: 981104 WPI ACCESSION NO.: 98-559435 (9848)
PRIORITY APPLIC. NO.: US 935433 APPLIC. DATE: 970923
NATIONAL APPLIC. NO.: EP 98302815 APPLIC. DATE: 980409
LANGUAGE: English
ABSTRACT: A new and specified human 2,288 bp DNA sequence encodes a specified sodium-dependent phosphate transporter (**IPT**-1) 690 amino acid protein sequence. Also claimed are: cDNA; an RNA or DNA **expression** system containing the new sequence; a host cell containing the **expression** system; a protein encoded by the DNA; an antibody immunospecific for the protein; an agonist or antagonist (e.g. antisense sequences) that modulates activity of the protein; and a recombinant cell or a membrane produced using the **expression** system and **expressing** the protein. The protein and DNA may be used for drug screening, therapy, gene therapy or diagnosis of chronic kidney failure, end-stage kidney disease, uraemic bone disease or cancer. The protein is produced by **transforming** or transfecting a host cell with the **expression** system, culturing the **transformant**, and collecting the protein from the culture medium. (24pp)

5/3,AB/125 (Item 4 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0220044 DBR Accession No.: 98-01641 PATENT
Vector for insertion of target gene into plants along with a marker gene - tobacco transgenic plant construction for use in crop improvement
AUTHOR: Sugita K; Uesugi M; Matsunaga E; Ebinuma H
CORPORATE SOURCE: Tokyo, Japan.
PATENT ASSIGNEE: Nippon-Paper **1997**
PATENT NUMBER: WO 9742334 PATENT DATE: 971113 WPI ACCESSION NO.: 97-558990 (9751)
PRIORITY APPLIC. NO.: JP 9780821 APPLIC. DATE: 970331
NATIONAL APPLIC. NO.: WO 97JP1569 APPLIC. DATE: 970509
LANGUAGE: JA

ABSTRACT: A new bacterium (especially Agrobacterium sp.) or virus (especially gemini virus, etc.) vector for the efficient introduction of a target gene into plants contains a marker gene, preferably a gene involved in the retention of Agrobacterium tumefaciens such as a cytokinin synthesis gene, especially the isopentenyltransferase (**ipt**) gene from T plasmid DNA, which can be deleted before or after **expression** of the target gene by application of an external stress such as light, heat or chemical treatment. The deletion can be detected by a morphological change in the transgenic plant tissue. The method is useful for crop improvement, especially for tobacco (Nicotiana tabacum) In an example, plasmid pNPI206 was constructed using beta-galactosidase (EC-3.2.1.23) from plasmid pBI121 as the target gene and **ipt** as the deletable marker. The ends of the eliminable section were sequences derived from plasmid pNPI128. Plasmid pNPI206 was inserted into A. tumefaciens LBA4404 and used to **transform** tobacco leaves. The **transformants** were regenerated in the presence of acetosyringin. (44pp)

5/3,AB/126 (Item 5 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0219018 DBR Accession No.: 98-00615 PATENT
New genetic constructs for **transformation** of organisms, particularly plants - Cre-recombinase or Flp-recombinase co-**expression** with a ribozyme, antisense RNA, sense suppression RNA or plant growth factor biosynthetic gene, in a tobacco or potato transgenic plant
AUTHOR: Surin B P; de Feyter R C; Graham M W; Waterhouse P M; Keese P K ; Shahjahan A
CORPORATE SOURCE: Campbell, Australian Capital Territory, Australia; Acton, Australian Capital Territory, Australia.
PATENT ASSIGNEE: CSIRO; Univ.Australian-Nat. **1997**
PATENT NUMBER: WO 9737012 PATENT DATE: 971009 WPI ACCESSION NO.: 97-526087 (9748)
PRIORITY APPLIC. NO.: AU 969031 APPLIC. DATE: 960329
NATIONAL APPLIC. NO.: WO 97AU197 APPLIC. DATE: 970327
LANGUAGE: English
ABSTRACT: A new construct has a DNA cassette with a recombinase unit (with a Cre-recombinase or Flp-recombinase gene, terminator and 1st promoter) linked to a transgene unit (with 1 or more transgenes and 2nd promoters), flanked by 2 recombinase-binding recombination loci (e.g. lox or frt sites). The transgene may encode a ribozyme, antisense RNA, co-suppression RNA, or may be a selectable marker, reporter gene or an auxin or cytokinin biosynthetic gene or regulatory sequence (e.g. an **ipt** gene). An intron may be inserted to disrupt recombinase **expression**. The cassette may be **expressed** in a tobacco (Nicotiana tabacum), potato (Solanum tuberosum), sweet potato, Jerusalem artichoke, taro, yam, eucalyptus, pine, aspen, gerbera, chrysanthemum, orchid, lily, rose, fuchsia, azalea, carnation, camellia, gardenia, orange, lemon, grapefruit, tangerine, lime, apple, pear, strawberry, raspberry, loganberry, blackberry, sugarcane, banana, plantain, pineapple or asparagus transgenic plant. The construct may be used for selective removal or integration of transgenes, with tight regulation of **expression**. (84pp)

5/3,AB/127 (Item 6 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0199851 DBR Accession No.: 96-10031
Marker-free transgenic plants produced by a novel **transformation** method 'MAT vector system' - multi-auto-**transformation** vector

the polylinker had been destroyed. The insertion was ligated into the EcoRI and Asp718 sites found by the left border of pGA643A, creating plasmid pMJM. pMJM was **transformed** into A. tumefaciens LBA4404 and Agrobacterium rhizogenes A4T which were then used for plant **transformation** . Of the 6 cytokinins quantified, zeatin riboside and its stabilized dihydro-derivative, dihydrozeatin riboside, showed the greatest increases in the **transformed** Petunia tissue (up to 600-fold). The importance of measuring changes in individual cytokinins is discussed. (48 ref)

5/3,AB/131 (Item 10 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0155893 DBR Accession No.: 93-13945 PATENT
Wheat transgenic plant construction with herbicide resistance using plasmid pPCV702nifD and plasmid pPCV702GUS - with a kanamycin-resistance selectable marker, a nopaline-synthase promoter and a beta-glucuronidase reporter gene
PATENT ASSIGNEE: Max-Planck-Ges.; Ramot-Univ. **1993**
PATENT NUMBER: WO 9318168 PATENT DATE: 930916 WPI ACCESSION NO.: 93-303482 (9338)
PRIORITY APPLIC. NO.: IL 101119 APPLIC. DATE: 920303
NATIONAL APPLIC. NO.: WO 93EP485 APPLIC. DATE: 930303
LANGUAGE: English
ABSTRACT: A method for producing transgenic wheat (Triticum aestivum) plants with herbicide resistance comprises: (a) applying a droplet of an aq. DNA solution onto one or more pollinated stigmas, the DNA solution comprising a suitable DNA vector carrying at least one gene foreign to the plant and capable of inducing **expression** of a required trait, and optionally an additional marker gene; (b) maintaining the DNA solution droplet on the stigma in a humid environment; (c) protecting the treated plant from additional pollination; and (d) collecting the seeds from the florets and growing them under conditions for selection of a wheat transgenic plant. Also claimed are plasmid pPCV702nifD and plasmid pPCV702GUS. In both plasmids, the APH(3')II or NPT(II) gene encoding aminoglycoside-phosphotransferase, linked to the NOS (nopaline-synthase) promoter and to the TL-DNA **ipt** gene polyadenylation signal, or PolyA, serve as a selectable marker for kanamycin-resistance. pPCV702nifD contains a region encoding Klebsiella pneumoniae nifD. pPCV702GUS includes a region encoding beta-glucuronidase (EC-3.2.1.31) reporter gene. (54pp)

5/3,AB/132 (Item 11 from file: 357)
DIALOG(R)File 357:Derwent Biotech Res.

0149502 DBR Accession No.: 93-07554 PATENT
DNA construct and tuber transgenic plant - cytokinin biosynthesis **ipt** gene cloning and **expression** in potato using a plasmid pCGP275 vector for crop improvement
PATENT ASSIGNEE: Calgene **1993**
PATENT NUMBER: WO 9307272 PATENT DATE: 930415 WPI ACCESSION NO.: 93-134461 (9316)
PRIORITY APPLIC. NO.: AU 918730 APPLIC. DATE: 911003
NATIONAL APPLIC. NO.: WO 92AU528 APPLIC. DATE: 921002
LANGUAGE: English
ABSTRACT: A new DNA construct contains a plant promoter (e.g. chs) and a sequence (e.g. **ipt**) encoding a molecule capable of enhancing tuber plant cytokinin levels. The tuber is preferably potato (Solanum tuberosum, preferred), sugarbeet (Beta vulgaris), sweet potato (Ipomoea